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EDITED BY

SIR DAVID PRAIN, C.M.G., C.I.E., LL.D., F.R.S.,

Director, Royal Botanic Gardens, Kew.

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Among the distant mountains.

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Royal Botanic Gardens, Kew,

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Tab. 8830.

STANHOPEA COSTARICENSIS.

Costa Rica.

Orchidaceae. Tribe Vandeae.

Stanhopea, *Frost; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 549.

Stanhopea costaricensis, *Reichb. f. in Hamb. Gartenz.* vol. xvi. (1860) p. 424; *Walp. Ann.* vol. vi. p. 589; *Hemsl. Biol. Centr.-Americana,* vol. iii. p. 257; *Rolfe in Orch. Rev.* 1913, p. 299; 1916, p. 186; species more *S. gravcolentis,* Lindl., peruvianae hypochilio quasi bigibbo insignis; ab ea tamen floribus luteis haud maculatis apte distinguenda.

Herba epiphytica; pseudobulbi aggregati, late ovoidei, subangulati, olivacei, 4–4·5 cm. longi, 3·5–4 cm. lati, vaginis ovato-lanceolatis subcoriaceis vestiti, monophylli. *Folia* longe petiolata, elliptico-oblonga, breviter acuminata, plicata, subcoriacea, margine subundulata, 25–33 cm. longa, 7–10 cm. lata; petiolus 7–8 cm. longus. *Scapi* axillares, penduli, circiter 12 cm. longi, vaginis elliptico-ovatis concavis subimbricatis vestiti, 2-flori; bracteae elliptico-ovatae, subobtusae, valde concavae, circiter 4 cm. longae; pedicelli 7–8 cm. longi. *Flores* grandes, speciosi, pallide flavi, brunneo-maculati. *Sepala* subconniventia; posticum elliptico-oblongum, obtusum, concavum, circiter 8 cm. longum; lateralia ovata, obtusa, valde concava, circiter 8 cm. longa. *Petala* revoluta, oblonga, obtusa, margine valde undulata, circiter 5 cm. longa. *Labellum* carnosum, profunde 4-lobum, circiter 3 cm. longum; hypochilium obovato-panduratum, latere carinatum, inferne intrusum, ore suborbiculare, canali subclausum; mesochilium profunde 2-partitum, brachiis falcato-incurvis, acuminatis; epichilium articulatum, ovatum, subobtusum, convexum. *Columna* subincurva, 7·5 cm. longa, supra medium dilatata; dentes subulati; anthera obovata; pollinia 2, obovato-linearia; stipes oblongo-linearis; glandula squamata. —R. A. Rolfe.

In 1860 Reichenbach described as *Stanhopea costaricensis* a Costa Rica orchid which flowered that year with Consul Schiller at Hamburg. The plant so named was subsequently lost and the species was known only from the original diagnosis. Towards the close of 1915 Mr. C. H. Lankester sent to Kew from Cachi in Costa Rica some interesting orchids collected by himself. One of these is a *Stanhopea* from moist and cool localities 4000 feet above sea-level, which flowered in July, 1916. It thrives, like other species of the genus, when grown

in a teak basket suspended from the roof of the warm Orchid House, if provided with abundant moisture in summer, and kept dry at the root in winter. This *Stanhopea* Mr. Rolfe thinks may be the lost species because under the hypochil of the lip there is a curious sac whose presence gives this organ a bigibbous appearance. This sac suggests greater affinity between our plant and the Peruvian *S. graveolens*, Lindl., than *S. Wardii*, Lodd., with which Reichenbach compared *S. costaricensis*. There are not many species of *Stanhopea* in Costa Rica, and there are few in the genus which have this sac. Either there are two species in Costa Rica with this sac, or our plant is identical with the Costa Rica *Stanhopea* flowered by Mr. Schiller at Hamburg in 1860. The original diagnosis does not mention the coloration or the dimensions of the flowers, and it is safest to identify provisionally the plant now figured with the one Reichenbach had in view. In our plant the sepals are buff-yellow with light red somewhat ring-like spots and with smaller spots on the petals and the lip, the latter organ having a pair of dark red ocular patches on the sides of the hypochil.

DESCRIPTION.—*Herb*, epiphytic; pseudobulbs clustered, wide ovoid, slightly angled, olive-green, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $1\frac{1}{3}$–$1\frac{1}{2}$ in. wide, clothed with ovate-lanceolate firm sheaths, 1-foliate. *Leaves* long-petioled, elliptic-oblong, shortly acuminate, plicate, firm, with slightly wavy margin, 10–13 in. long, 3–4 in. wide; petiole about 3 in. long. *Scapes* axillary, pendulous, about 5 in. long, clothed with elliptic-ovate, rather blunt, concave, slightly imbricate sheaths, 2-flowered; bracts elliptic-ovate, rather blunt, deep concave, about $1\frac{1}{2}$ in. long; pedicels about 3 in. long. *Flowers* large, showy, pale yellow with reddish-brown spots. *Sepals* somewhat connivent, about 3 in. long, the posterior elliptic-oblong, blunt, concave, the lateral ovate, blunt, deep concave. *Petals* revolute, oblong, blunt, with very wavy margin, about 2 in. long. *Lip* fleshy, deeply 4-lobed, about 3 in. long; hypochil obovate-panduriform, keeled at the side, invaginate below, with a rounded mouth and an almost occluded canal; mesochil deeply 2-partite with falcately incurved acuminate arms; epichil jointed, ovate, rather blunt, convex. *Column* incurved, 3 in. long, dilated above the middle; teeth subulate; anther obovate; pollinia 2, obovate-linear; stipe oblong-linear; gland scale-like.

TAB. 8830.—Fig. 1, lip, seen from above; 2, the same, seen from the side; 3, column; 4, anther-cap; 5, pollinia:—*of natural size, except* 4 and 5, *which are somewhat enlarged.*

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Tab. 8831.

RHODODENDRON LEDOIDES.

Yunnan.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron ledoides, *Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edinb.* vol. ix. p. 243 (1916); affinis *R. cephalantho*, Franch., sed ramulis gracilibus, foliis longioribus et angustioribus, perulis deciduis, floribus minoribus differt.

Fruticulus virgatus, fastigiatim vel subpatule ramosus, usque ad 0·7 m. altus; ramuli annotini squamis laxis brunneis et pilis breviter setosis obtecti; alabastra anguste ovoidea, subacuta, perulis dense lepidotis et pilis debilibus ciliatis. *Folia* lineari-lanceolata, minute mucronata, ad basin angustata, 2–3 cm. longa, 0·5–0·8 cm. lata, crasse coriacea, margine revoluta, supra atroviridia, obscure venulosa et squamis minutis satis densis notata, infra squamis stipitatis dense imbricatis fulvis obtecta; costa media supra sulcata, infra elevata et hinc demum laxe lepidota; petiolus 3 mm. longus, supra sulcatus, dense lepidotus. *Flores* rosei, in umbellam depresse globosam circiter 4·5 cm. diametro congesti; perulae externae plus minusve ovatae, usque ad 1 cm. longae, extra crebre lepidotae, dense ciliatae; pedicelli 1·5 mm. longi, laxe lepidoti. *Calyx* parvus, circiter 1·25 mm. longus, fere ad basin fissus, lobis imbricatis late rotundatis extra parce lepidotis ciliatis. *Corollae* tubus subcylindricus, 0·8–1 cm. longus, extra glaber, intus villosulus, limbo patulo 1·5–1·8 cm. expanso, lobis oblongo-orbicularibus marginibus undulatis. *Stamina* 5, inclusa, circiter 4 mm. longa, filamentis minute puberulis; antherae oblongae. *Ovarium* 5-loculare, squamis contiguis parvis dense lepidotum; stylus ovario paullo brevior, stigmate 5-lobulato coronatus. *Fructus* 8 mm. longus, breviter stipitatus, lepidotus.—J. Hutchinson.

Rhododendron ledoides is a charming plant, with the habit of a *Ledum*, which belongs to a group of forms, of which some fifteen are now known, spoken of as the *Cephalanthum* series of Rhododendrons. Nearly all of the members of this series have been discovered by Mr. George Forrest and Mr. Kingdon Ward. The headquarters of the group are at very high altitudes on the ridges which constitute the Tibeto-Yunnan frontier. *R. ledoides* was met with by Mr. Forrest in 1913, at about 13,000 feet above sea-level, on the mountains to the north-east of the Yangtze bend, in Lat. 27° 45′ N.,

where it occurs as a small shrub, two feet high, in open stony places. Seed received from Mr. Forrest was sown in spring, 1914, by Mr. J. C. Williams of Caerhays Castle, Cornwall, who also shared some with Kew. The plants raised by Mr. Williams, to whom we are indebted for the material for our figure, flowered with him in 1917. The flowers, Mr. Williams finds, range from pink to white, and those that at first are flushed with pink are apt to fade to white. The plant is not difficult to raise, but, as is the case with very many species in this genus, there is much difference between the truss of a well-grown plant such as the one figured, and that of a badly grown one.

Description.—*Shrublet* 2–2½ ft. high, fastigiately or rather loosely branched, young shoots clothed with loose brown scales and short stiff hairs; buds narrow-ovoid, rather acute, their scales densely scaly and weakly ciliate. *Leaves* linear-lanceolate, finely mucronate, narrowed to the base, ¾–1¼ in. long, ⅛–⅓ in. wide, firmly leathery, revolute at the edge, dark-green on the upper surface which is indistinctly veined and rather closely scaly, below closely covered with tawny imbricate stipitate scales; midrib grooved above, raised beneath and there ultimately loosely scaly; petiole ⅛ in. long, channelled above, densely scaly. *Flowers* rose-coloured, clustered in a flattened subglobose umbel about 1¾–2 in. across; outer bud-scales more or less ovate, about ⅛ in. long, closely scaly externally and densely ciliate; pedicels ¼ in. long, loosely scaly. *Calyx* small, about 1/20 in. long, split nearly to the base; lobes wide rounded, imbricate, sparingly scaly and ciliate externally. *Corolla* hypocrateriform; tube cylindric, ⅓–⅖ in. long, glabrous externally, rather villous within; limb spreading, ⅔–¾ in. across; lobes oblong-orbicular with margin undulate. *Stamens* 5, included, about ⅙ in. long; filaments finely puberulous; anthers oblong. *Ovary* 5-celled, densely beset with small contiguous scales; style somewhat shorter than the ovary, tipped by the 5-lobulate stigma. *Capsule* ⅓ in. long, shortly stipitate, scaly.

Tab. 8831.—Fig. 1, portion of a leaf; 2, scales from upper surface of leaf; 3, scales from lower surface of leaf; 4, a flower; 5, calyx and pistil; 6, vertical section of corolla; 7 and 8, stamens; 9, transverse section of ovary:—*all enlarged.*

M.S del J.N.Fitch.lith

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Tab. 8832.

ILEX verticillata.

Eastern North America.

Ilicineae.

Ilex, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 356.

Ilex (§ Prinos) **verticillata,** *A. Gray, Man. Bot. N. United States,* ed. ii. p. 264 (1856); *Small, Flora S.E. United States,* p. 732; *Rob. et Fern. in Gray, Man. Bot. N. United States,* ed. vii. p. 555; *C. K. Schneider in Handb. Laubholzk.* vol. ii. p. 167. figs. 105, 109; *Dallimore, Holly, Yew and Box,* p. 148; *Bean, Trees & Shrubs Brit. Isles,* vol. i. p. 651; species *I. laevigatae,* A. Gray, proxima sed ab ea foliis subtus secus nervos semper pubescentibus floribusque omnibus brevissime pedicellatis facillime segreganda.

Frutex 2–6-metralis plerumque dioicus; novelli in planta typica glabri, atro-brunnei, lenticellis pallidis parce notati. *Folia* decidua, ovata, anguste **obovata vel oblanceolata, apice acuta vel acuminata, basi cuneata,** margine minute saepius inaequaliter serrata vel 2-serrata, 3·8–8·5 cm. **longa; 1·2–3·3 cm. lata, supra glabra vel parce puberula, subtus et** praesertim prope costam mediam persistenter pubescentia, insigniter **reticulata; petiolus 6–12 mm. longus.** *Flores* **in umbellas axillares** subsessiles aggregati; pro glomerulo maris 6 vel plures, foeminei 1–3. *Calyx* **5–6-lobatus; lobi ciliati, acuti.** *Corolla* **rotata, 5 mm. lata,** sordide alba; lobi saepius 6, nonnunquam 7–8, rotundati, obtusi. *Stamina* saepius 6, nonnunquam 7–8, corollae lobis alterna, filamenta perbrevia; **antherae longitudinaliter apertae.** *Ovarium* **ovoideum, 6-loculare,** nonnunquam 7–8-loculare; stigma sessile stellatim 6-lobata, nonnunquam 7–8-lobata. *Fructus* drupacei, globosi vel ovoidei, saepissime singuli nonnunquam pro axilla bini vel terni, 6 mm. longi; pyrenae 4–6, compressae, 3 mm. longae, pallide brunneae, laeves, amarae.—*Prinos verticillatus,* **Linn. Sp. Pl. ed. 1, p. 330 (1753); DC. Prod. vol. ii. p. 17; Loud. Arb. et Frut. vol. ii. p. 521. fig. 191;** Gray, Man. Bot. N. United States, ed. i. p. 276; Emerson, Trees Mass. ed. i. p. 344.—W. J. Bean.

The North American Winterberry, sometimes also known in north-eastern America as the Black Alder, has long been a favourite in English gardens, to which, according to Aiton, it was introduced for the first time in 1736. It is found wild over a wide area on the eastern side of North America, ranging from Nova Scotia and

Wisconsin in the north, to Missouri and Florida in the south. In many parts of this area it is abundant, preferring low and damp or even swampy situations. *Ilex verticillata* is the commonest and best known in gardens of that section in which the leaves are deciduous, of the genus to which our common Holly belongs. Linnæus, who named it *Prinos verticillatus* in 1753, and most of the older writers, indeed regarded these Hollies which are not evergreen as constituting a genus apart. The modern view, based on the identity in floral structure in the two groups, is that *Prinos* is only a subgenus or section of *Ilex*, though it is to be noted that the leaves in *Prinos*, besides being deciduous, differ also in their membranous texture from those of the *Aquifolium* section, to which the true Holly belongs. In *Prinos*, moreover, the parts of the female flower, though similar in shape and arrangement, are usually more numerous than in *Aquifolium*. The nearest ally of *I. verticillata* is *I. laevigata*, A. Gray, the Smooth Winterberry of American writers, which occurs in the same natural habitats, but can be readily distinguished from the common Winterberry by its leaves, which are nearly or quite glabrous, by the longer pedicels of its male flowers, and by its entire calyx-lobes, which are not ciliate. Like many other North American trees and shrubs that affect swamps and damp places in a state of nature, *I. verticillata* thrives best in this country in good well-drained loamy or peaty soil. There are few more beautiful fruit-bearing shrubs when it carries an abudant crop of its bright red drupes. But to secure this result thorough ripening of its wood is essential, and for this reason the plants must be given a position fully exposed to the south. *I. verticillata* can be propagated either by seed or by cuttings, the latter being made of leafy shoots, in July. The fruit-bearing twig figured in our plate was supplied by Messrs Waterer and Sons of Bagshot in October, 1917, when it happened to be in bearing and in unusual profusion. The male and female flowering twigs were supplied from the Kew collection, where the plant thrives well, but does not always fruit freely. A variety with yellow fruit, which Professor Robinson has distinguished as var. *chrysocarpa*, is also in cultivation along with other forms that differ

from each other in the shape, texture and pubescence of the leaves.

Description.—*Shrub* 8–20 ft. high, usually dioecious; young shoots glabrous in the typical form, dark brown, sparingly beset with pale lenticels. *Leaves* deciduous, oval, narrowly obovate, or oblanceolate, acute or acuminate, base cuneate, margin finely and often unevenly serrate or 2-serrate, $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, $\frac{1}{2}$–$1\frac{1}{4}$ in. wide, glabrous or slightly pubescent above, always pubescent beneath especially near the midrib, strongly reticulate; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Flowers* produced in short-stalked axillary umbels, the males 6 or more in a cluster, the females 1–3 in a cluster. *Calyx* 5–6-lobed, the lobes ciliate, acute. *Corolla* rotate, dull white, $\frac{3}{16}$ in. across; lobes usually 6, occasionally 7–8; rounded, obtuse. *Stamens* usually 6, occasionally 7–8, alternate with the corolla lobes; filaments very short; anthers dehiscing longitudinally. *Ovary* ovoid; cells usually 6, sometimes 7–8; stigma sessile, stellately 6–8-lobed. *Fruit* a scarlet globose or ovoid drupe, usually solitary, occasionally in pairs or threes in each axil, $\frac{1}{4}$ in. long; stones (pyrenes) compressed, $\frac{1}{8}$ in. long, 4–6 in each drupe, pale brown, smooth, bitter.

Tab. 8832.—Fig. 1, base of leaf and flower; 2, male flower laid open; 3, female flower; 4, the same, petals and stamens removed; 5, transverse section of ovary:—*all enlarged.*

M.S. del. J.N. Fitch. lith.

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CORNUS Kousa.

China, Corea and Japan.

Cornaceæ.

Cornus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 950.

Cornus (§ Benthamia) **Kousa**, *Buerg. Mss. apud Miq. in Ann. Mus. Bot. Lugd.-Bat.* vol. iii. p. 159 (1865); *Garden*, 1893, vol. i. p. 152, t. 898; *Sargent in For. Flor. Jap.* p. 47; *Shirasawa in Icon. Ess. Jap.* vol. ii. t. 59; *C. K. Schneider in Handb. Laubholzk.* vol. ii. p. 454, fig. 301, 302; *Bean in Kew Bull.* 1915, p. 179 cum ic., *et in Trees & Shrubs*, vol. i. p. 389 cum ic.; species cum *C. capitata*, Wall., comparanda eaque quam maxime congruens sed foliis deciduis haud persistentibus apte distinguenda.

Arbor 8–9-metralis vel *frutex*; novelli glabrescentes vel glabri. *Folia* opposita, decidua, apice acuminata, basi rotundata vel late cuneata, margine integra, ambitu ovata oblonga vel suborbiculata, supra saturate viridia, subtus pallidiora cinereo-viridia, 2·5–10 cm. longa, 2–4·5 cm. lata, utrinque sed facie inferiori praecipue pilis brevibus appressis induta et in nervorum lateralium axillis utrinsecus floccis 4–5 villorum brunnescentium notata; petiolus 0·4–1·2 cm. longus, minute pubescens. *Flores* numerosi, 2 mm. lati, in capitulum 0·9 cm. latum aggregati; capitula bracteis speciosis 4 involucrata pedunculoque gracili 3·8–8·8 cm. longa suffulta; bracteae albae, late ovatae vel ovato-lanceolatae, apice acuminatae, basi cuneatae, longitudinaliter 6–10-nerves, horizontaliter patentes vel parum deflexae, 3·8–6 cm. longae, 1·2 2·5 cm. latae. *Calyx* minutus. *Petala* 4, oblonga, concava, 3-nervia, pubescentia, 1·5 mm. longa. *Stamina* totidem, filamentis glabris. *Stylus* filamentis brevior, sericeo-pubescens. *Fructus* carnosi in congeriam rubram arbuteam globosam 1·2–1·8 cm. latam conglutinati.—*C. japonica*, Koehne, Dendrol. p. 438 (1893); non Thunb. *Benthamia japonica*, Sieb. et Zucc. Flor. Jap. vol. i. p. 38, t. 16 (1835).—W. J. Bean.

Cornus Kousa, originally found in Japan on the mountains of Kiusiu and of Nippon, has a wide distribution in north-eastern Asia, for it has since been discovered in Corea and in China. The plant from which the material for our figure was obtained was received at Kew from the Arnold Arboretum in 1910, where it had been raised from seed collected by Mr. E. H. Wilson in western Hupeh three years previously. Wilson has reported that he found it abundant both north and south of Ichang, at altitudes of from 4000 to 7000 feet, both as a shrub and as a small, flat-topped tree, fifteen to thirty feet in

height. He has stated that the fruit is edible. This species, along with the evergreen *C. capitata*, Wall., of the Himalayas, constitutes the Asiatic subgenus which Lindley recognised as the genus *Benthamia*. This group is characterised by the large corolla-like involucre and more especially by the coalescence of the fruits into a fleshy strawberry-like mass. This latter feature distinguishes the two constituent species from *C. florida*, Linn., figured at t. 8315 of this work, and *C. Nuttallii*, Audubon, figured at t. 8311, which together form the subgenus *Benthamidia*, Spach. These latter two also have a large showy involucre, but in both the fruits remain free and both are confined to North America. *C. Kousa* flowers in May and thrives very well in the British Isles, over the greater part of which it should be quite hardy. It has never suffered from cold at Kew. It likes a deep well-drained, loamy soil and a sunny position. It is less sensitive to injury by late spring frosts than *C. florida* is, and when in flower may be described as one of the most beautiful as well as remarkable of hardy shrubs. It varies a good deal as regards the size of the involucre and the Chinese form introduced from Hupeh, which is figured here, has the largest and most striking bracts of any we have seen in cultivation, though among the fine series of specimens from Japan preserved in the Kew herbarium there are some with bracts quite as large as those of this Chinese plant.

Description.—*Tree* up to 30 ft. high, or a shrub, young branchlets glabrous or glabrescent. *Leaves* deciduous, opposite, ovate, oblong or suborbicular, apex acuminate, base rounded or broadly cuneate, margin entire, 1–4 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide, dark green above, paler grey-green beneath, with short adpressed hairs on both surfaces, but more copious beneath, where also tufts of brown tomentum occur in the axils of the nerves beneath; lateral nerves in 4–5 pairs; petiole $\frac{1}{6}$–$\frac{1}{2}$ in. long, minutely pubescent. *Flowers* $\frac{1}{12}$ in. in diameter, sessile, closely packed in heads $\frac{3}{8}$ in. across, which are subtended by 4 large white petaloid involucral bracts, and are borne on a slender glabrous or minutely pubescent peduncle $1\frac{1}{2}$–$3\frac{1}{2}$ in. long; bracts wide ovate to ovate-lanceolate, acuminate, cuneate at the base, with 6–10 longitudinal nerves, horizontally spreading or slightly deflexed, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, $\frac{1}{2}$–1 in. wide. *Calyx* minute. *Petals* 4, oblong, concave, $\frac{1}{16}$ in. long, pubescent, 3-nerved. *Stamens* 4; filaments glabrous. *Style* clothed with silky hairs. *Fruits* fleshy, united in a red, strawberry-like, globose mass $\frac{1}{2}$–$\frac{3}{4}$ in. wide.

Tab. 8833.—Fig. 1, flower; 2, section of flower, the petals removed; 3 and 4, anthers with portion of filament;—*all enlarged.*

Tab. 8834.

RHODODENDRON VERNICOSUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599,

Rhododendron vernicosum, *Franch. in Journ. de Bot.* vol. xii. p. 258 (1898); affinis *R. Fortunei*, Lindl., sed foliis minoribus basi inaequaliter rotundatis nec cordatis et corollae tubo late campanulato differt.

Frutex divaricatus usque ad 4·5 m. altus (*Forrest*); ramuli teretes, atrobrunnei, glabri, sicco nitiduli, annotini circiter 6 mm. crassi. *Folia* laxe disposita, elliptica, apice late rotundata et obtuse mucronata, basi inaequaliter rotundata vel subtruncata, 6–11 cm. longa, 2·5–6 cm. lata, tenuiter coriacea, supra viridia et plerumque nitida, infra pallidiora delicate et crebre reticulata, utrinque glabra: costa media supra anguste canaliculata, infra elevata; nervi laterales utrinsecus 14–16, a costa sub angulo lato abeuntes, graciles, marginem versus evanidi et ramosissimi; petioli 2–3·5 cm. longi, glabri, supra anguste canaliculati. *Inflorescentia* terminalis, circiter 10-flora; bracteae mox deciduae, dense villosae; pedicelli nutantes, 2–2·5 cm. longi, glandulis viscidis parvis subsessilibus ornati. *Calyx* brevissimus, circiter 1·5 mm. longus, inaequaliter 5-lobulatus, lobulis late ovatis extra glandulis breviter stipitatis instructis. *Corolla* pallide rosea, late tubuloso-campanulata; tubus 2·5 cm. longus, glaber; lobi 1·5 cm. longi, 2 cm. lati, apice late emarginati. *Stamina* 12–14, breviter exserta; filamenta glabra; antherae flavo-brunneae, 3 mm. longae. *Ovarium* 6–7-loculare, glandulis subsessilibus dense obtectum, leviter sulcatum; stylus staminibus longior, pallide viridis, 3 cm. longus, glandulis viscidis minimis rubescentibus brevissime stipitatis ornatus, stigmate lobulato coronatus. — *Rhododendron lucidum*, Franch. in Journ. de Bot. vol. ix. p. 390 (1895); non Nutt. (1853). *R. Fortunei*, var. *lucidum*, Millais, Rhodod. p. 169 (1917).—J. Hutchinson.

The handsome Chinese Rhododendron here described was first met with by the Abbé Soulié in 1893 in the forests of Tongolo and in the vicinity of Ta-chien-lu in Western Szechuan and was characterised two years later, under the name *Rhododendron lucidum*, by the late Mr. Franchet. The author in so doing had overlooked the fact that, forty years earlier, Mr. Nuttall had described a very different Himalayan species under the same name. Five years later, however, having discovered his oversight, Mr. Franchet substituted for the Chinese plant the

name *R. vernicosum* now employed. A decade later seeds of *R. vernicosum* were secured by Mr. E. H. Wilson for Messrs J. Veitch and Sons, and the material for our plate came from a plant purchased by Kew from Messrs Veitch in 1908. It has been fully realised in English collections that this is not *R. lucidum*, Nutt., but this has been counterbalanced by the belief that Soulié's species is a variety, var. *lucidum*, of another Chinese Rhododendron described by Lindley in 1859 as *R. Fortunei*, T. Moore. The flowers of the true *R. Fortunei* differ much from those of the Szechuan plant; they lack the fragrance and do not exhibit the crumpled appearance characteristic of the opening blooms of *R. Fortunei*. The smaller leaves, unequally rounded at the base, and the shape of the corolla-tube are also distinguishing features. Since the collection of *R. vernicosum* by Mr. Wilson, the species has been found again by Mr. G. Forrest in North-West Yunnan, where it grows on the borders of pine forests on the eastern flank of the Li-chiang range at about 11,000 feet above sea-level, as a spreading shrub sometimes fifteen feet in height. The species is perfectly hardy at Kew and thrives in peaty soil or sandy loam free from lime. It prefers a position where it is protected from the rays of the mid-day sun.

Description.—*Shrub* of spreading habit, in a wild state up to 15 ft. in height; twigs cylindric, dark brown, glabrous, somewhat polished when dry, $\frac{1}{4}$ in. thick in their second season. *Leaves* laxly arranged, elliptic, wide rounded and bluntly mucronate at the tip, unequally rounded or nearly truncate at the base, $2\frac{1}{4}$–$4\frac{1}{4}$ in. long, 1–$2\frac{1}{4}$ in. wide, thinly leathery, green and usually polished above, paler and finely closely reticulate beneath, glabrous on both surfaces, midrib narrowly channelled above and raised beneath, lateral nerves 14–16 along each side the midrib, which they leave at a wide angle, slender, much branched and disappearing towards the leaf-margin; petiole $\frac{3}{4}$–$1\frac{1}{4}$ in. long, glabrous, narrowly channelled above. *Inflorescence* terminal, about 10-flowered; bracts densely villous, quickly deciduous; pedicels nodding, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, beset with small subsessile viscid glands. *Calyx* very short, about $\frac{1}{16}$ in. long, unequally 5-lobulate; lobules wide ovate, beset outside with shortly stipitate glands. *Corolla* pale rose, wide tubular-campanulate; tube 1 in. long, glabrous; lobes $\frac{2}{3}$ in. long, $\frac{3}{4}$ in. wide, shallow emarginate. *Stamens* 12–14, shortly exserted; filaments glabrous; anthers yellowish-brown, $\frac{1}{8}$ in. long. *Ovary* 6–7-celled, densely clothed with almost sessile glands, slightly sulcate; style longer than the stamens, pale green, $1\frac{1}{4}$ in long, beset with minute reddish short-stalked, viscid glands, crowned by the lobulate stigma.

Tab. 8834.—Fig. 1, apex of a leaf; 2, calyx and pistil; 3 and 4, stamens; 5, transverse section of ovary:—*all enlarged*.

MS del J.N.Fitch lith.

Vincent Brooks, Day & Son Lt.a imp

Tab. 8835.

ERICA Haroldiana.

South Africa.

Ericaceae. Tribe Ericeae.

Erica, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 590.

Erica Haroldiana, *Skan*; species nova *E. nobili*, Guthrie et Bolus, affinis, sed sepalis multo angustioribus et brevioribus dimidium tubi corollae vix superantibus, tubo corollae leviter longiore multo angustiore apice minus constricto facile distinguenda.

Frutex parvus, erectus, valde ramosus, ad 5 dm. altus vel ultra. *Ramuli* erecti, rigidi, dense foliati, pallide brunnei, glabri. *Folia* ternata, brevissime petiolata, primo erecta, demum patentia, lineari-subulata, 8-20 (saepius 10-14) mm. longa petiolo incluso, 1·25-2 mm. lata, apice breviter aristata, supra leviter complanata, infra profunde sulcata, glauca, crassiuscula, sulco brevissime villoso excepto glaberrima. *Inflorescentia* terminalis, umbelliformis, laxe 4-5-flora. *Flores* sat magni, conspicui, nutantes. *Pedicelli* 7-8 mm. longi, glabri, rubri. *Bracteae* 2, oppositae, pedicelli infra medium insertae, oblongo-lanceolatae, concavae, acutae, 7 mm. longae, 2-2·5 mm. latae, glabrae, albidae, rubro-tinctae, basi et apice viridescentes. *Calyx* fere ad basin 4-partitus, vix 1 cm. longus, glaber: lobi parum inaequales, oblongo-lanceolati, acuti vel apiculati, 2·5-4 mm. lati, corollae tubo adpressi, colore bracteis simillimi. *Corolla* 1·8 cm. longa, alba, tubo leviter viridi-tincto apice plus minusve roseo, limbo rubro, glaberrima; tubus elongato-urceolatus, apice paulum constrictus, medio 5 mm., apice vix 2·5 mm. diametiens: lobi 4, primo erecti, demum reflexi, ovati, obtusi, apice interdum minute denticulati, margine leviter incurvi, circiter 3 mm. longi, 2·5 mm. lati. *Stamina* 8, corollae tubo paulum breviora, glabra; filamenta gracillima, complanata, 1 cm. longa, alba; antherae aureae, subovoideae, vix 2 mm. longae; loculi basi paulum cordati, rima breve prope apicem subacutum dehiscentes, uterque basi appendice lanceolata fimbriata 2·5 mm. longa praeditus. *Ovarium* obovoideum, apice depressum, 4-lobum, basi in stipitem brevem crassum angustatum, 3·5 mm. longum, apice circiter 2 mm. latum, basi 1 m. latum, 4-loculare; stylus paulum exsertus, glaber, albidus; stigma peltato-capitatum, leviter 4-lobum, roseum; ovulae numerosae, subellipsoideae, papillosae.—S. A. Skan.

This attractive heath, a new species of the small section *Eurystegia* of the subgenus *Chlamydanthe*, as defined by Guthrie and Bolus in the Flora Capensis, was discovered by the late Professor H. H. W. Pearson on the Cederberg Range in the Clanwilliam Division, and seeds

were sent by him to Kew from the National Botanic Garden, Kirstenbosch, in 1915. One of the plants raised from these seeds has now reached a height of about eighteen inches and flowered in a greenhouse in January, 1919. Its flowers are rather large and effective, and should the plant prove floriferous it will be a welcome addition to the number of winter-flowering heaths in cultivation. Among the Cape species of *Erica* already described, now nearly 500, *E. Haroldiana* (named after its discoverer, who is also commemorated in the genus by *E. Pearsoniana*, L. Bolus) is clearly most nearly allied to *E. nobilis*, Guthrie and Bolus, a little-known plant which, like that now described, is found on the Cederberg Range. It may, however, easily be distinguished by the characters mentioned above. *E. Monsoniana*, Linn., of which the variety *exserta*, Klotzsch, is figured at t. 1915 of this Magazine as *E. Monsoniae*, is also an ally, but, particularly when young, its branches are covered with a floccose pubescence, its much shorter leaves are ciliate, and its flowers terminate very short lateral branches arising below the tips of the shoots. *E. glauca*, Andr., figured at t. 580 of this work, is a pretty species belonging to the same section, but quite distinct. Other Ericas recorded from the Cederberg Range are *E. verecunda*, Salisb., *E. Thunbergii*, Montin, and *E. inflata*, Thunb., all obviously different from *E. Haroldiana*, though *E. inflata* resembles it in habit, umbellate inflorescence, and somewhat in the corolla which, however, is smaller, while the calyx and bracts are quite dissimilar. *E. Haroldiana* seems to be quite happy and is making good growth, under the cool greenhouse treatment accorded the other members of this genus from S. Africa.

Description. *Shrub* 1½ ft. high or somewhat taller, erect, much branched; twigs erect, rigid, densely leafy, pale brown, glabrous. *Leaves* ternate, very shortly stalked, at first erect, at length spreading, linear-subulate, including the petiole from $\frac{1}{3}$-$\frac{1}{2}$ in. long, usually about $\frac{1}{2}$ in. long, $\frac{1}{16}$—$\frac{1}{12}$ in. wide, shortly aristate, slightly flattened above, deeply grooved beneath, glaucous, rather thick, shortly hairy along the furrow, elsewhere glabrous. *Inflorescence* terminal, umbellate, loosely 4–5-flowered. *Flowers* rather large and striking, nodding; pedicels $\frac{1}{3}$ in. long, glabrous, red; bracts 2, opposite, situated below the middle of the pedicel, oblong-lanceolate, concave, acute, over $\frac{1}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{10}$ in. wide, glabrous, white flushed with red, greenish at tip and base. *Calyx* 4-partite almost to the base, over $\frac{1}{3}$ in. long, glabrous; lobes slightly unequal, oblong-lanceolate, acute or apiculate, $\frac{1}{10}$–$\frac{1}{6}$ in. wide, adpressed to the corolla-tube, in colour like the bracts. *Corolla* $\frac{3}{4}$ in. long, white, the tube

slightly tinged with green except at the top where it is flushed with rose, the limb red, everywhere glabrous; tube long-urceolate, rather narrowed at the mouth, $\frac{1}{5}$ in. wide about the middle, hardly $\frac{1}{10}$ in. wide at the mouth; lobes 4, at first erect, at length reflexed, ovate, obtuse, sometimes finely toothed at the tip, about $\frac{1}{8}$ in. long, $\frac{1}{10}$ in. wide. *Stamens* 8, rather shorter than the corolla-tube, glabrous; filaments very slender, flattened, $\frac{1}{5}$ in. long, white; anthers golden yellow, almost ovoid, hardly $\frac{1}{12}$ in. long; cells slightly cordate at the base, opening by a short chink near the subacute tip, each with a lanceolate fimbriate basal appendage $\frac{1}{10}$ in. long. *Ovary* obovoid, depressed at the apex, 4-lobed, narrowed at the base, with a short thick stipe, $\frac{1}{7}$ in. long, about $\frac{1}{12}$ in. wide at the top, barely half as wide at the base, 4-celled; style slightly exserted, glabrous, whitish; stigma peltate-capitate, slightly 4-lobed, rose-coloured; ovules numerous, nearly ellipsoid, papillose.

Tab. 8835.—Fig. 1, leaf; 2, flower; 3 and 4, stamens; 5, pistil; 6, transverse section of ovary:—*all enlarged.*

M.S. del. [illegible]

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Co. London.

TAB. 8836.

PRIMULA PULVINATA.

Yunnan.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula pulvinata, *Balf. f. et Ward in Notes Roy. Bot. Gard. Edinb.* vol. ix. p. 193 (1916); affinis *P. pseudobracteatae*, Petitm., sed efarinosa, haud scabrida; insuper pedunculis 2–3-floris differt.

Herba parva, pulvinata, efarinosa, glandulis viscidis longe stipitatis molliter vestita. *Folia* longe petiolata, lanceolata, apice obtusa, basi in petiolum alatum longe attenuata, usque ad 6 cm. longa, 1·3 cm. lata, crenato-undulata, chartacea, supra subbullato-nervosa, glanduloso-puberula, infra pilosa, nervis lateralibus utrinsecus circiter 6 prominulis, petioli circiter 2 cm. longi, 3 mm. lati, uninervii, basin versus straminei et subtranslucentes. *Pedunculi* ad 1·5 cm. longi, 2–3-flori, dense glanduloso-puberuli; bracteae lanceolatae, acutae, circiter 1 cm. longae; pedicelli graciles, bracteas aequantes. *Flores* aurei, inter folia immersi. *Calyx* usque ad 1 cm. longus, ultra medium 5-lobus, extra stipitato-glandulosus, lobis lanceolatis obtusis. *Corollae* tubus 1·2 cm. longus, cylindricus, supra stamina ampliatus, extra glanduloso-puberulus, intus prominenter transverse rugosus, apice leviter constrictus; lobi 5, obcordati, circiter 1 cm. longi, apice profunde emarginati. *Antherae* ad os corollae tubi insertae, 2 mm. longae. *Ovarium* viride, depresso-globosum; stylus brevis, stigmate globoso coronatus.—J. HUTCHINSON.

The *Primula* here figured is a native of North-west Yunnan where it was first discovered by Mr. F. Kingdon Ward in June, 1913, on precipices above a glacier two days' journey to the west of Atuntsu, at an altitude of 11,000 feet above the sea. Mr. Ward notes that the species, which has been described by Professor Bayley Balfour and himself as *P. pulvinata*, occurs naturally in large tufts, and Professor Balfour speaks of it in cultivation in the Royal Botanic Garden, Edinburgh, as a dainty cushion-plant. The figure now published has been prepared from a living plant kindly forwarded for the purpose by Professor Balfour. It was raised in the Edinburgh garden from the seeds supplied by Messrs. Bees, Limited, to whom they had been communicated from Yunnan by Mr. Ward. At Edinburgh where the

species has been grown in pots as well as planted out under glass in a house devoted to rock-plants, *P. pulvinata* has proved easy to cultivate at all stages. It does not appear to be fastidious as to soil; a good loam with a liberal supply of broken limestone or crushed potsherds and sand gives satisfactory results. It is not yet possible to say from experience that it will prove entirely hardy out of doors, but in the cold greenhouse it has withstood fifteen degrees of frost without suffering damage. Being evergreen, growth appears to go on during the whole year. Mr. Harrow, to whom through Professor Balfour we are indebted for this information, regards it as probable that the best hope for success out of doors will be where the plant is grown in a situation where the water, of which it requires at all seasons a fair amount, can drain away quickly from the collar and roots. At Kew the plant has been accorded the treatment suitable for *P. Forrestii* with satisfactory results. The great difficulty, as Professor Balfour points out, with the Primulas of this group, and the circumstance that militates against their satisfactory cultivation as garden plants, is winter damp. These species show a crisp type of withering of their leaves, and while they can resist a moderate amount of top-water, cannot live if their withering leaves become sodden.

Description.—*Herb*, forming dense cushions; individual plants dwarf, devoid of mealiness, softly clothed with viscid distinctly stalked glands. *Leaves* long-petioled, lanceolate, blunt at the tip, gradually narrowed to the base into the winged petiole, up to $2\frac{1}{4}$ in. long, over $\frac{1}{2}$ in. wide, with crenulately wavy margin, papery, somewhat bullately veined and glandular-puberulous above, pilose beneath, lateral nerves somewhat raised, about 6 on each side the midrib; petiole about $\frac{3}{4}$ in. long, $\frac{1}{5}$ in. wide, 1-nerved, towards the base straw-coloured and somewhat translucent. *Peduncle* nearly $\frac{2}{3}$ in. long, 2–3-flowered, densely glandular-puberulous; bracts lanceolate, acute, over $\frac{1}{3}$ in. long; pedicels slender, as long as the bracts. *Flowers* embedded among the leaves. *Calyx* $\frac{1}{3}$ in. long or longer, 5-lobed beyond the middle, clothed outside with stalked glands; lobes lanceolate, blunt. *Corolla* golden-yellow; tube $\frac{1}{2}$ in. long, cylindric, widened above the staminal insertion, glandular puberulous outside, strongly transversely rugose within, slightly narrowed at the mouth; lobes 5, obcordate, over $\frac{1}{3}$ in. long, deeply emarginate. *Anthers* adnate at the mouth of the corolla-tube, $\frac{1}{12}$ in. long. *Ovary* green, depressed-globose; style short, crowned by the globose stigma.

Tab. 8836.—Fig. 1, leaf; 2, portion of leaf, showing indumentum and venation; 3, inflorescence; 4, calyx; 5, corolla, laid open and showing staminal insertion; 6 and 7, anthers; 8, pistil:—*all enlarged, except* 1 *and* 3, ***which are of natural size.***

2.

3.

1.

M S. del, J.N.F. lith.

Huth imp.

L.Reeve & Cº London

Tab. 8837.

SYMPHYANDRA asiatica.

Corea.

Campanulaceae. Tribe Campanuleae.

Symphyandra, *A.DC.; Benth. et Hook. f. Gen. Plant.* vol. ii. p. 563.

Symphyandra asiatica, *Nakai in Tokyo Bot. Mag.* vol. xxiii. p. 188 (1909); species *S. creticae*, A.DC., affinis sed foliis saepissime minoribus, inflorescentiis laxioribus differt.

Herba perennis, caulibus cum inflorescentiis 2–8 dm. altis glabris subfistulosis. *Folia* caulina ovata vel lanceolato-ovata, apice acuminata, basi acuta, truncata vel cordata, usque ad 7·5 cm. longa, 4 cm. lata, margine grosse incurvato-dentata, costa et nervis lateralibus in pagina superiore leviter impressis, subtus prominentibus, supra pilis albis sparse instructa, subtus glabra vel fere glabra; petiolus fere 3 cm. longus, glaber. *Inflorescentia* ramosa, laxa, floribus circiter 5 nutantibus praedita bracteae (folia floralia) parvae, sessiles, inferiores majores, summae lineares, 3–4 mm. longae. ***Receptaculum* turbinatum, 5 mm. longum, apice 3·3 mm. diametro,** glabrum. *Calycis* segmenta distantia, linearia, 1–1·6 cm. longa, 1·5–3 mm. **lata, margine serrata, in alabastro plus minusve recurvata.** *Corolla* campanulata, 4 cm. longa, glabra; lobi semi-orbiculares mucronati, paulo **patentes, 3·5 cm. diametro.** *Stamina* **1·6 cm. longa, filamentis superne** glabris inferne hirsutis basi dilatatis, parte dilatata ovata vel hemisphaerica 2 mm. longa hirsuta margine dense ciliata, antheris linearibus connatis **1 cm. longis.** *Discus* **epigynus inflato-hemisphaeroideus, 1·5 mm. altus.** *Stylus* cum stigmatibus 2·8 cm. longus, superne puberulus, inferne glaber. —*Hanabusaya asiatica*, Nakai in Flora Koreana, vol. ii. p. 62 (Journ. Coll. Sci. Tokyo, vol. xxxi. 1911).—W. B. Turrill.

The striking Campanulaceous species now figured was first described by Mr. Nakai in 1909 as a *Symphandra*. Two years later its author came to the conclusion that it represents a distinct genus which he named *Hanabusaya*. In the work in which this revised view is stated Mr. Nakai does not lay emphasis on the points by which it may be distinguished from *Symphandra* and, as we have failed to detect any such, we have here employed his original name, *S. asiatica*. Perhaps the most remarkable feature connected with this Corean plant is its geographical isolation. The other species of the genus *Symphandra* are confined to South-eastern Europe, the Caucasus, Armenia, Lazistan

and northern Persia, and the species to which the Corean *S. asiatica* is most closely related is the Candian *S. cretica*, A.DC., one that has long been known. For the material from which our plate has been prepared we are indebted to Mr. G. W. E. Loder, who received seed of the species collected by Mr. E. H. Wilson in Corea. This seed was sown in two pots, in March, 1918, and flowered in a cool house in Mr. Loder's garden at Wakehurst Place, Ardingly, Sussex, during June and July, 1919. One of these pots with seedlings, some of them in flower, was presented to the Kew collection by Mr. Loder and enabled the figure now supplied to be made. So far the hardiness of the species has not been put to the test of cultivation in the open.

Description.—*Herb*, perennial; stem, including the inflorescence, 8 in. to 2½ ft. high, glabrous, somewhat fistulose. *Leaves* ovate or lanceolate-ovate, acuminate, base cuneate or truncate or cordate, up to 3 in. long, 1⅔ in. wide, margin coarsely toothed, midrib and lateral nerves slightly sunk above, raised beneath, upper surface sparingly beset with white hairs, lower glabrous or nearly so; petiole over 1 in. long, glabrous. *Inflorescence* branched, lax, about 5-flowered, the flowers nodding; bracts (floral leaves) small, sessile, the lower the larger, the uppermost linear, ⅛–⅙ in. long. *Receptacle* turbinate, ⅕ in. long, about ⅐ in. wide at the top, glabrous. *Calyx* 5-lobed; segments distant, linear, ⅓–⅔ in. long, 1/16–⅛ in. wide, serrate, more or less recurved in bud. *Corolla* campanulate, ⅔ in. long, glabrous; lobes semi-orbicular, mucronate, slightly spreading, 1½ in. across. *Stamens* ⅔ in. long; filaments glabrous above, hirsute below, dilated at the base, the expanded portion ovate or semi-orbicular, 1/12 in. long, hirsute with the margin densely ciliate; anthers linear, connate, ⅓ in. long. *Disk* epigynous, inflated, very short. *Style*, including the stigmas, over 1 in. long, puberulous upwards, glabrous below.

Tab. 8837.—Fig. 1, section of calyx, showing stamens and pistil; 2, anthers; 3, base of filaments:—*all enlarged*.

M.S. del, J.N.F lith.

Huth imp.

L. Reeve & Co London.

Tab. 8838.

PAVETTA abyssinica.

East Tropical Africa.

Rubiaceae. Tribe Ixoreae.

Pavettá, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 114.

Pavetta abyssinica, *Fresen. in Mus. Senck.* vol. ii. p. 166 (1837); *A. Rich. Fl. Abyss.* vol. i. p. 352 (1847); *Hiern in Oliv. Fl. Trop. Afr.* vol. iii. p. 173 (1877); species foliis nervis lateralibus numerosis infra pilosis inflorescentiis subsessilibus calycis tubo extra glabro stylis longissime exsertis distincta.

Frutex usque ad 2 m. altus; ramuli pallide cinerei, ad nodos villosi. *Folia* obovato-elliptica, apice obtuse acuminata, basi cuneata, plerumque circiter 15 cm. longa et 4 cm. lata, sed interdum usque ad 24 cm. longa et 10 cm. lata, margine undulata, tenuiter papyracea, supra primum setulosa, demum glabra, infra praesertim secus nervos laxe pilosa; nervi laterales utrinsecus 12-14, a costa sub angulo lato abeuntes, utrinque straminei, infra prominentes; petioli circiter 2 cm. vel usque ad 3·5 cm. longi, laxe pilosi; stipulae submembranaceae, caducae, 1 cm. longae, longe acuminatae, intus dense villosae. *Inflorescentia* laxiflora, subsessilis, stylis inclusis circiter 12 cm. diametro; pedicelli circiter 4 mm. longi, glabri. *Calycis* tubus cylindricus, 5 mm. longus, glaber; lobi 4, lineares, 4 mm. longi, parce pilosi vel fere glabri. *Corolla* alba; tubus 2 cm. longus, extra glaber, intus breviter pilosus; lobi 4, oblongo-lanceolati, acuti, circiter 1 cm. longi, 3 mm. lati. *Antherae* breviter exsertae, virides, 6 mm. longae, mucronatae. *Stylus* 3·5 cm. exsertus, apicem versus breviter et molliter pubescens, minute 2-fidus. *Fructus* niger, nitidus, globosus, circiter 8 mm. diametro, calyce persistente coronatus.—*Pavetta congesta*, Br. in Salt, Abyss. App. p. lxiii. (1814); nomen.—J. Hutchinson.

The Rubiaceous genus *Pavetta* is restricted to the Eastern hemisphere, five-sixths of the species being confined to the tropical regions of south-eastern Asia and Africa, the remaining sixth occurring in South Africa. Among the members of the South African group of species one, *P. caffra*, Linn. f., an old and long known plant in European collections, has been figured at t. 3580 of this work. The plant now figured is one of the Tropical African species, which is a native of Abyssinia and Uganda, where it grows in the warm zone on the lower slopes of the mountains. This species was first met with by Mr. Henry Salt during his travels in the

interior of Abyssinia in 1809–10 on behalf of the British Government. Dr. Robert Brown, who identified the plants collected by Salt, named this one *P. congesta*. Unfortunately no description of the species was published at the time, and when the plant was met with again by Dr. Rüppell, who found it on the way from Halei to Temben in Abyssinia, it was in 1837 for the first time described by Fresenius from Rüppell's specimens as *P. abyssinica*. In 1916 the plant was sent to Kew from Kampala in Uganda, where it is also wild, as a species of *Clerodendron*; for its introduction to cultivation we are indebted to the Agricultural Department of the Government of Uganda. Nearly three years later it flowered in February, 1919, in a tropical house at Kew, and thus provided material for the preparation of our plate. It has thriven well under the conditions suitable for the Indian species of *Ixora* and *Pavetta*, and had reached a height of six feet before it flowered. As in the case of the Indian species of *Pavetta*, the flowers of *P. abyssinica* are very fragrant.

Description.—*Shrub*, 6–8 ft. high; twigs pale grey, villous at the joints. *Leaves* obovate-elliptic, bluntly acuminate, cuneate at the base, usually about 6 in. long by $1\frac{3}{4}$ in. wide, but sometimes 9–10 in. long by 4 in. across, margin undulate, thinly papery, at first setulose but soon glabrous above, laxly hairy, especially on the nerves beneath; lateral nerves 12–14 on each side of the midrib which they leave at a wide angle, pale on both surfaces and raised beneath; petiole usually about $\frac{3}{4}$ in. long, but in large leaves $1\frac{1}{4}$ in. long, laxly hairy; stipules almost membranous, caducous, $\frac{2}{5}$ in. long, long acuminate, densely villous on the inner face. *Inflorescence* nearly sessile yet laxly flowered, including the far exserted styles about 5 in. across; pedicels about $\frac{1}{6}$ in. long, glabrous. *Calyx* with a narrow cylindric tube $\frac{1}{3}$ in. long, glabrous; lobes 4, linear, $\frac{1}{4}$ in. long, sparingly hairy or nearly glabrous. *Corolla* white; tube $\frac{3}{4}$ in. long, glabrous outside, shortly hairy within; lobes 4, oblong-lanceolate, acute, about $\frac{2}{5}$ in. long. *Anthers* slightly exserted, green, $\frac{1}{4}$ in. long, mucronate. *Style* $1\frac{1}{3}$ in. long, shortly and softly pubescent towards the tip which is stoutly 2-fid. *Fruit* black, shining, globose, about $\frac{1}{3}$ in. across, crowned by the persistent calyx-lobes.

Tab. 8838.—Fig. 1, part of lower surface of leaf; 2, flower; 3, calyx; 4 and 5, anthers; 6, ovary; 7, upper portion of the style:—*all enlarged*.

M.S. del, J.N.F. lith.

Huth imp.

L. Reeve & Cº London.

Tab. 8839.

PLEUROTHALLIS punctulata.

Colombia.

Orchidaceae. Tribe Epidendreae.

Pleurothallis, *R. Br.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 488.

Pleurothallis punctulata, *Rolfe in Gard. Chron.* 1888, vol. iv. p. 756; species distincta, a *P. inflata*, Rolfe, foliis farinaceo-glaucis et spatha ampla valde differt.

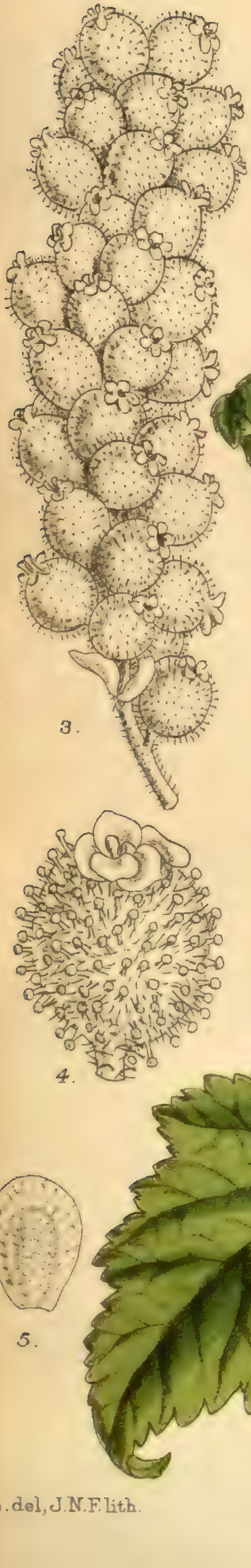
Herba epiphytica, 12–15 cm. alta. *Caules* subteretes, subgraciles. 5–7 cm. longi, ad medium vaginis tubulosis angustis vestiti, monophylli. *Folia* breviter petiolata, ovato-elliptica, subacuta, coriacea, copiose farinaceo-glauca, 6–8 cm. longa, 2–2·5 cm. lata, prope basin subrecurva; petioli 0·5 cm. longi, semitorti. *Spatha* axillaris, conduplicata, carinata, lanceolato-oblonga, glauca, 2·5–3 cm. longa, 0·5 cm. lata. *Pedunculus* 5–6 cm. longus, uniflorus. *Flores* mediocres, flavi, purpureo-punctulati. *Sepala* subconniventia; posticum lanceolatum, subacutum, 2·5 cm. longum, 0·9 cm. latum; lateralia connata, limbum obovato-ellipticum, subacutum, concavum, 2·5 cm. longum, 1 cm. latum effingentia. *Petala* late lanceolata, acuta, 0.9 cm. longa, 3 mm. lata. *Labellum* subtrilobum, 1·5 cm. longum, atropurpureum; lobi laterales erecti, oblongi, obtusi, 0·6 cm. longi; lobus intermedius ellipticus, obtusus, subconcavus, 1·1 cm. longus; discus papilloso-asperulus. *Columna* clavata, 0·8 cm. longa, alis angustis integris. *Pollinia* 2, pyriformia.—R. A. Rolfe.

The very large and natural Orchidaceous genus *Pleurothallis* contains relatively few species that can be regarded as valuable from the standpoint of the orchid grower. The species here figured, *P. punctulata*, may be included among those worthy of a place in a good collection, even if its claims on aesthetic grounds are not of a high standard, owing to its rarity. To a place in the pages of this Magazine it is fully entitled because of its considerable botanical interest. It seems to be unique in the genus *Pleurothallis* for the glaucous hue of the leaves, due to a dense coating of greyish-white farina. It is also curious on account of a characteristic twist at the base of the petiole, the effect of which is to bring the solitary flower opposite the under-surface of the leaf. This feature was alluded to when the species was first described by Mr. Rolfe, now thirty years ago, but was then cautiously adverted to as possibly an accidental circumstance. The experience of a generation

shows that the character is as constant as it is peculiar. There are other features of an anomalous nature which tend to render the affinity of our plant doubtful. While it is, as Mr. Rolfe points out, most comparable with the Colombian *P. inflata*, Rolfe, a species certainly referable to the group *Macrophyllae-Fasciculatae* as defined by the late Professor Lindley, the plant figured produces a solitary flower from a large spathe like that in the natural section *Spathaceae*. Yet it differs essentially from the true members of that section, in all of which the flowers are disposed in many-flowered racemes. The history of *P. punctulata* is simple, so far as it goes. The species flowered for the first time in cultivation in December, 1888, with Messrs James Veitch and Sons, Chelsea, and was then submitted to Kew for identification with the information that it had been imported, as a solitary plant, from New Granada, three years before. Shortly thereafter, the plant passed into the collection of Mr. R. I. Measures of Camberwell, with whom it flowered in December, 1902. No other plant of the species is known to have been imported, and no wild specimen has been met with in herbarium collections, so that the precise habitat of *P. punctulata* in Colombia is still uncertain. In February, 1908, a small portion of the original plant, secured by division, was presented to the Kew Collection. This plant has thriven well in a cool house under the conditions suitable for species of *Masdevallia*, and came into flower in November, 1918, when our figure was made.

Description.—*Herb*, epiphytic, 5-6 in. high. *Stems* nearly cylindric, rather slender, 2–3 in. long, clothed halfway up with narrow tubular sheaths, 1-foliate. *Leaves* shortly petioled, ovate-elliptic, rather acute, coriaceous, copiously mealy-glaucous, $2\frac{1}{4}$–$3\frac{1}{4}$ in. long, $\frac{3}{4}$–1 in. wide, recurved near the base; petiole $\frac{1}{5}$ in long, twisted at the base. *Spathe* axillary, conduplicate, keeled, lanceolate-oblong, glaucous, 1–$1\frac{1}{4}$ in. long, $\frac{1}{5}$ in. wide. *Peduncle* 2–$2\frac{1}{4}$ in. long, 1-flowered. *Flowers* medium-sized, yellow, punctulate with purple spots. *Sepals* more or less connivent; posterior sepal lanceolate, rather acute, 1 in. long, over $\frac{1}{3}$ in. in. wide; lateral pair connate in an obovate-elliptic somewhat acute, concave limb 1 in. long, $\frac{2}{5}$ in. wide. *Petals* wide lanceolate, acute, over $\frac{1}{3}$ in. long, $\frac{1}{8}$ in. wide. *Lip* somewhat 3-lobed, $\frac{2}{3}$ in. long, dark purple; lateral lobes erect, oblong, blunt, somewhat concave, nearly $\frac{1}{2}$ in. long; disk harsh papillose. *Column* clavate, $\frac{1}{3}$ in. long; wings narrow, entire. *Pollinia* 2, pyriform.

Tab. 8839.—Fig. 1, flower, the sepals removed; 2, petal; 3, column; 4, pollinia, seen from in front and from behind:—*all enlarged.*



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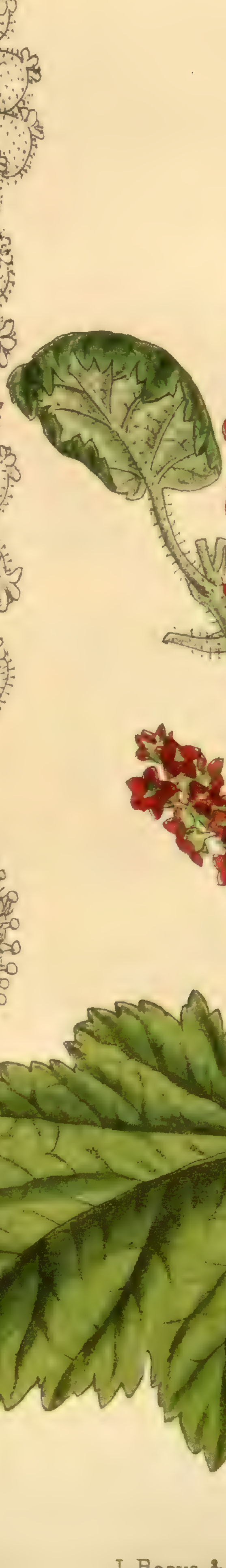
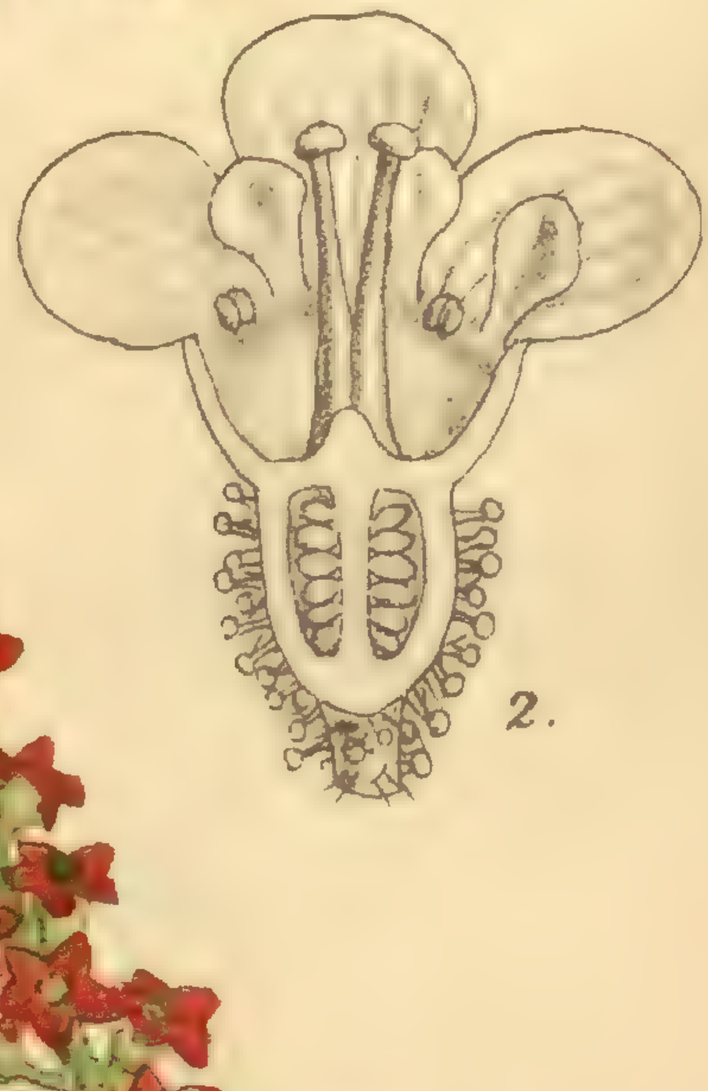


A.

1.



2.

4.

5.

B.

S. del, J.N.F. lith. Huth imp.

L. Reeve & Cº London.

Tab. 8840.

RIBES Jessoniae.

West China.

Ribesiaceae. Tribe Ribesieae.

Ribes, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 654 (Saxifragaceae); *Janczewski, Monogr. Grosseill. in Mem. Soc. Phys. et Hist. Nat. Genève*, vol. xxxv. pp. 199–518.

Ribes (§ Berisia) **Jessoniae**, *Stapf*; species nova arcte affinis *R. Maximowiczii*, Bat., sed racemis perlongis multifloris, fructibus setis glanduliferis breviori-bus tenuioribus multo laxius vestitis plane distinctum.

Frutex dioicus, ramosus, elatus, ad 2 m. altus, inermis; rami hornotini ramulique tenuiter pubescentes et sparsim glanduloso-setulosi, vetustiores cortice badio vel fusco longitudinaliter fisso obtecti. *Folia* forma varia, magis minusve ovata, lata, basi subtruncata vel saepius haud alte cordata, plerumque 3- vel 5-lobata vel sublobata, rarius elobata, grosse et inae-qualiter duplo-serrato-dentata, 6–10 cm. longa lataque, supra pilis brevis-simis parcis obsita, infra molliter pilosa imprimis ad nervos; petioli 2–4 cm. longi, patule villosi et praeterea glanduloso-setulosi. *Racemi* in brachycladiis terminales, erecti vel subnutantes, deinde ob ramulum e brachycladio evolutum pseudo-laterales, 12–15 cm. longi; bracteae lanceo-latae, acutae, 5–7 mm. longae, pubescentes et parce glandulosae; pedicelli 3–4 mm. longi, indumento eodem ac bracteae. *Flores* ♂ pelviformes. *Receptaculum* 2 mm. altum, pubescens et basi glandulosum. *Calyx* intense fusco-ruber; lobi subrotundi, 2–3 mm. longi. *Petala* minuta, 1 mm. longa, spatulato-unguiculata, ungui lineari, limbo 1 mm. lato. *Stamina* 1 mm. longa, filamentis basi paulo dilatatis. *Styli* ovarii im-perfecti 2 mm. longi, basi connati, petala aequantes. *Flores* ♀ simillimi, nisi receptaculo in ovarium inferum ovoideum villosulum et setis glandu-liferis 0·5 mm. longis densius obtectum deducto, antheris ad tubercula receptaculo adnata redactis et stylis ad medium coalitis petala superantibus. *Fructus* ovoideo-globosus, ad 1 cm. diametro, flore persistente coronatus, rufo- vel rubro-lutescens, albido-pubescens et setis glanduliferis 1 mm. longis laxiuscule tectus. *Semina* ambitu obovato-elliptica, fere 2 mm. lata, brunnea, vix marginata.—*R. Maximowiczii*, Jancz. in Bull. Acad. Sci. Cracov. 1910, p. 75, partim; Rehder in Sargent, Plant. Wilson. vol. i. p. 46, 153; Schneider, Handb. Laubholzk. vol ii. p. 498, quoad spec. Wilson; W. J. B[ean] in Gard. Chron. 1916, vol. lix. p. 272, fig. 114; non Bat., nec Jancz. Monogr. Grosseill. *R. Maximowiczii*, var. *floribundum*, Jesson in Kew Bull. 1915, p. 347.—O. Stapf.

The very interesting *Ribes* figured here was discovered by Mr. E. H. Wilson in Western Szechuan in July, 1903, and was collected by him again near Ta-chien-lu in 1904. According to the Plantae Wilsonianae it was found by the same collector in 1908 and in 1910 in various other

localities, all in Western Szechuan. The shrub, which attains a height of six to nine feet and is notable on account of its sometimes red and at other times orange glandular fruits, occurs in woodlands and thickets up to an elevation of 9400 feet above sea-level. The plant was first introduced to cultivation, from Mr. Wilson's earlier seeds, by Messrs James Veitch and Sons, and in 1915 a flowering branch stated to be of Chinese origin and to represent one of Mr. Wilson's plants (958a) was submitted to Kew for identification by Colonel S. R. Clarke of Borde Hill, Cuckfield, Sussex. The spray sent was readily identified with Mr. Wilson's plant of the 1903 collection (3759) and Miss Jesson, who established this fact, regarded it as a very distinct variety of *Ribes Maximowiczii*, Bat., a species discovered by Mr. Potanin in Eastern Kansu, which is characterised by its short extremely compact fruiting racemes, with the individual fruits closely covered with coarse bristles. The affinity between the two shrubs is indeed extremely close, but the additional material now available shows that it is more satisfactory to regard Miss. Jesson's variety as a separate species, readily distinguished by its much elongated inflorescences with more numerous flowers and especially by the much shorter and less plentiful glandular bristles which cover the berries. Professor Janczewski, who has included the Szechuan plant now described in the species from Kansu which Batalin named *R. Maximowiczii*, only knew the latter in the fruiting condition, and, although he placed it in the section *Berisia*, was disposed to believe that it may really belong to his section *Parilla*. There seems now no doubt, however, that the arrangement actually adopted by Janczewski is correct, for the plant now figured as *R. Jessoniae* and named in compliment to the lady who first indicated the differences between it and the plant from Kansu, is certainly a member of the section *Berisia*, which differs from *Parilla* in having erect in place of pendent racemes, in having no ovules in the female flowers and in having no pollen in the reduced anthers of the male flowers: in *Parilla* the male flowers have sterile pollen and the female have sterile ovules. The material for our plate has been derived, as regards the male inflorescence, from a plant in the collection at

Kew; for the female inflorescence and the fruit we are indebted to the kindness of Mrs. Berkeley of Spetchley Park, Worcester, in whose garden they were produced. It is to be noted that as they ripen in this country the fruits are of a pale rusty yellow colour, not orange or red as they are in Szechuan. At Kew the shrub is perfectly hardy and thrives well in loamy soil. It can be increased readily by cuttings. The section *Berisia* to which it belongs contains seventeen species, most of them Chinese, though it includes also the well-known *R. alpinum*, Linn., a native of Europe and Northern Asia.

Description.—*Shrub*, 6–9 ft. high, branching freely, unarmed, dioecious; twigs of the first season thinly pubescent and sparingly glandular-setulose; bark of older twigs brown or tawny, cracking longitudinally. *Leaves* variable in shape, more or less ovate, wide, more or less truncate or often slightly cordate at the base, usually more or less 3–5-lobed, the lobes often shallow, rarely absent, the margin at the same time coarsely twice serrate, $2\frac{1}{4}$–4 in. long and broad, sparingly beset with short hairs above, softly hairy beneath especially on the nerves; petiole $\frac{3}{4}$–$1\frac{2}{3}$ in. long, laxly hirsute and at the same time glandular-setulose. *Racemes* 5–6 in. long, at the tips of short flower-shoots, erect or somewhat nodding, but assuming an apparently lateral position as the flower-shoot elongates; bracts lanceolate, acute, $\frac{1}{5}$–$\frac{1}{3}$ in. long, pubescent and sparingly glandular; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. long, also pubescent and glandular. *Male flowers* saucer-shaped. *Receptacle* $\frac{1}{12}$ in. long, pubescent and glandular at the base. *Calyx* deep tawny red; lobes rather rounded, $\frac{1}{12}$–$\frac{1}{8}$ in. long. *Petals* minute, spathulate-unguiculate, the claw linear, the limb $\frac{1}{24}$ in. across. *Stamens* $\frac{1}{24}$ in. long; filaments slightly dilated at the base. *Styles* of the imperfect ovary $\frac{1}{12}$ in. long, connate at the base, as long as the petals. *Female flowers* resembling the male, but with the receptacle of the inferior ovary ovoid, finely villous and densely clothed in addition with glandular bristles $\frac{1}{5}$ in. long, with the anthers reduced to tubercles adnate to the receptacle and with the styles, which are connate half way up, longer than the petals. *Fruit* ovoid globose, over $\frac{1}{3}$ in. in diameter, tipped by the persistent female flower, red or reddish-yellow, clothed with white hairs, and in addition with a sparse covering of glandular bristles over $\frac{1}{3}$ in. long. *Seeds* obovate-elliptic in outline, nearly $\frac{1}{12}$ in. across, brown, faintly marginate.

Tab. 8840.—Fig. A, male inflorescence; 1, male flower in vertical section; B, female inflorescence; 2, female flower, in vertical section; 3, fruiting raceme; 4, fruit; 5, seed:—*all enlarged except* A, B, *and* 3, *which are of natural size.*

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Tab. 8841.

RHODODENDRON serotinum.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron serotinum, *Hutchinson in Rhod. Soc. Notes*, 1918, p. 191 (nomen); species *R. Fortunei*, Lindl., et *R. decoro*, Franch., affinis, ab illo filamentis inferne molliter pubescentibus, ab hoc foliis basi inaequaliter cordatis corollae tubo externe papilloso-glanduloso et ab ambobus habitu longe ramoso et corolla interne maculata differt.

Frutex usque ad 3 m. altus, ramis elongatis laxis; ramuli vetustiores flavo-brunnei, laeves, nitidi, annotini virides nitidi, lenticellis minutis pallidioribus notati. *Folia* oblongo-elliptica, basi inaequalia et leviter cordata, apice rotundata, retuso-mucronata, 10–15 cm. longa, 6–7 cm. lata, glabra, supra opaco-viridia, infra glauco-viridia, conspicue reticulata et minutissime papillosa, papillis brevissimis suborbicularibus in venulis vix contiguis inter venulos densissimis et crystallinis; nervi laterales utrinsecus circiter 15, a costa media sub angulo fere 90° abeuntes, marginem versus valde ramosi, infra distincti; petioli 2–3·5 cm. longi, glabri, fere teretes, circiter 3·5 mm. crassi. *Inflorescentia* breviter racemosa, terminalis, 7–8-flora; axis 3 cm. longa, minute glanduloso-papillosa; bracteae extra pilosae, pedicelli 3–4·5 cm. longi, 3·5 mm. crassi, pallide straminei roseo suffusi, minute papilloso-glandulosi. *Calyx* obliquus, circiter 8 mm. diametro, undulato-lobatus, secus marginem et externe glandulis sessilibus minutis rubris ornatus. *Corolla* subnutans, odorata, alba, externe roseo leviter suffusa, intra tubum dorso rubro maculata et suffusa; tubus late infundibuliformis, 4–4·5 cm. longus, extra glandulis albidis stipitatis munitus; lobi 7, patentes, late suborbiculares, apice late emarginati, circiter 2 cm. longi et 3 cm. lati. *Stamina* 15–16, inaequalia, dorsalia breviora, usque ad 4·5 cm. longa; filamenta alba, inferne breviter pubescentia; antherae pallide brunneae, 4·5 mm. longae. *Ovarium* 10-loculare, oblongo-ovoideum, 6 mm. longum, glandulis albidis brevissime stipitatis indutum; stylus stamina paullo superans, 4–4·5 cm. longus, albus, stigmate ellipsoideo vel suborbiculare 4–4·5 mm. lato viscoso pallide viride coronatus. *Fructus* ignotus.—J. Hutchinson.

The new *Rhododendron* here figured was received as a seedling from the Jardin des Plantes at Paris in 1889, under the name *R. decorum*, Franch., and was raised there from seed sent by Delavay from China where *R. decorum* is a native plant. There are, however, many differences

between the species described by Mr. Franchet and that now described as *R. serotinum*. The latter is of long and straggling growth, a feature so marked in one of the two healthy plants grown in the Himalayan House at Kew, that it admits of being trained up one of the pillars which support the roof. This character, the fact that the leaves are unequally cordate at the base, and the circumstance that the corolla outside is beset with many bottle-shaped glands are marks that at once distinguish *R. serotinum* from *R. decorum*. From *R. Fortunei*, Lindl., another close ally and a member of the same natural group, *R. serotinum* differs especially by its hairy filaments. From both species mentioned *R. serotinum* may be distinguished by its blotched corolla, an unusual feature in the group to which all three belong. Out of doors *R. serotinum* was grown for a number of years in the Rhododendron Dell at Kew, and appeared to be perfectly hardy. But save when in flower it was principally remarkable for its gaunt sparsely branched habit, and when the stem was at last broken off at ground-level during a gale, the plant was not replaced. If space can be found for it in a collection it nevertheless is not unworthy of a place, for the flowers are handsome and delightfully fragrant, and they exhibit one feature that cannot but appeal to growers of Rhododendrons. Even under the protection of the Himalayan House the species does not begin to flower until well into August, and continues to produce blossoms from then till the end of October. In the Kew plants the leaves exhibit three or four parallel impressions on each side of the midrib, perhaps the consequence of their disposition in the bud stage.

Description.—*Shrub*, up to 10 ft. high; branches long and lax; other twigs yellowish-brown, smooth, polished; young shoots green, polished, marked with minute pale lenticels. *Leaves* oblong-elliptic, base slightly and unequally cordate, apex rounded, retusely mucronate, 4–6 in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. wide, glabrous, dull green above, glaucous-green beneath, conspicuously reticulated and finely papillose, the papillae very short, suborbicular, not quite in contact along the veinlets but dense and crystalline between the veinlets; lateral nerves about 15 on each side of the midrib, from which they diverge at an angle of 90°, much branched towards the leaf-margin, distinct on the under surface; petiole $\frac{3}{4}$–$1\frac{1}{2}$ in. long, glabrous, nearly cylindric, about $\frac{1}{7}$ in. thick. *Inflorescence* shortly racemose, terminal, 7–8-flowered; axis $1\frac{1}{4}$ in. long, minutely glandular-papillose; bracts pilose externally; pedicels $1\frac{1}{4}$–$1\frac{3}{4}$ in. long, $\frac{1}{7}$ in. thick, pale straw-coloured and flushed with rose, minutely glandular-papillose. *Calyx*

oblique, about $\frac{1}{3}$ in. across, undulately lobed, covered outside and on the margin with minute red sessile glands. *Corolla* somewhat nodding, fragrant, white slightly flushed with rose outside; within the back of the tube blotched and tinged with red; tube wide funnel-shaped, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, with white-stalked glands outside; lobes 7, spreading, wide suborbicular, widely notched at the tip, about $\frac{3}{4}$ in. long and $1\frac{1}{4}$ in. across. *Stamens* 15–16, unequal, the dorsal the shorter, up to $1\frac{3}{4}$ in. long; filaments white, shortly pubescent below; anthers pale brown, about $\frac{1}{6}$ in. long. *Ovary* 10-locular, oblong-ovoid, $\frac{1}{4}$ in. long, clothed with white shortly-stalked glands; style rather longer than the stamens, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, white, crowned by the ellipsoid or suborbicular viscous pale green stigma, which is about $\frac{1}{6}$ in. wide.

Tab. 8841.—Fig. 1, apex of leaf; 2, under surface of leaf; 3, calyx and pistil; 4 and 5, stamens; 6, transverse section of ovary:—*all enlarged.*

M.S del, J.N.F lith.

Huth imp.

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Tab. 8842.

BULBOPHYLLUM macrobulbum.

New Guinea.

Orchidaceae. Tribe Epidendreae.

Bulbophyllum, *Thouars; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum macrobulbum, *J. J. Sm. in Bull. Dep. Agric. Ind. Néerl.* n. xxxix. (1910) p. 4, *et in Lorentz, Nova Guinea*, vol. viii. (1911), p. 579, t. 98, fig. B; *Schlechter in Fedde, Rep. Nov. Sp., Beibl.* p. 760; species *B. Fletcheriano*, Rolfe, maxime affinis, sed sepalis valde brevioribus et petalis amplioribus differt.

Herba epiphytica, glauca. *Pseudobulbi* aggregati, ovoidei, crassi, obtuse angulati, 5–8 cm. longi, 4–6 cm. lati, sordide olivacei, albido-maculati, deinde rugosi, monophylli. *Folia* crasso-coriacea, recurva, oblonga vel anguste oblonga, obtusa, 18–21 cm. longa, 5–6·5 cm. lata, glauco-viridia, praesertim subtus pruinosa, margine et costa media obscure purpurea, basi attenuata. *Racemi* axillares, valde abbreviati, ad basin pseudobulborum aggregati, 4–5-flori. *Bracteae* late ovatae, concavae, 2–2·3 cm. longae, apice acuminatae et recurvae. *Pedicelli* circiter 1·5 cm. longi. *Flores* magni, carnosi, foetidi, flavescenti-albi, purpureo-maculati et lineati, labellum cum petalorum basi atrosanguineum. *Sepalum* posticum oblique erectum, ovatum, valde acuminatum, concavum, circiter 3·5–4 cm. longum; sepala lateralia oblique ovata, falcato-recurva, acuminata, 3·5–4 cm. longa. *Petala* unguiculata, ovata, subacuta, undulata, circiter 2·3 cm. longa. *Labellum* recurvum, carnosum, elliptico-oblongum, subobtusum, 1·2 cm. longum; discus sulcatus, verrucosus. *Columna* lata, brevissima; alae ovatae, falcato-acuminatae, 0·7 cm. longae; pollinia 2, obovoidea.—*B. Balfourianum*, Hort. ex Gard. Chron. 1915, vol. lviii. p. 53, fig. 18; Rolfe in Orch. Rev. 1915, pp. 247, 256.—R. A. Rolfe.

For the introduction to English collections of the remarkable New Guinea species of *Bulbophyllum* now figured, orchid growers are indebted to Messrs. Sander and Sons, St. Albans, by whom it was publicly exhibited in July, 1915, under the name *B. Balfourianum*. The plant in question thereafter was added to the collection of Mr. H. T. Pitt, Rosslyn, Stamford Hill, to whose courtesy we are indebted for the material for our plate which was kindly supplied when the plant was in blossom in June, 1919. The name under which the species has thus found its way into cultivation is not, however, one

that can be sustained since the species was discovered during the second Lorentz Expedition to New Guinea, was afterwards in cultivation in the Buitenzorg Botanic Garden, and was there adequately described as *B. macrobulbum* by Mr. J. J. Smith. When publishing this account, Mr. Smith referred the species to the section *Sestochilos*, but it has since been treated by Mr. Schlechter, who met with the plant again in North-eastern New Guinea, as the type of a distinct section, *Macrobulbum*. The species is remarkable for its very glaucous leaves, a character wherein it agrees with the allied *B. Fletcherianum*, figured at t. 8600 of this work as *Cirrhopetalum Fletcherianum*, Rolfe. The individual flowers bear some resemblance to those of *Cymbidium Huttonii*, Lindl., figured in this magazine at t. 5676. In cultivation it calls for the tropical treatment suitable for other species of the genus.

Description.—*Herb*, epiphytic, glaucous; pseudobulbs clustered, ovoid, stout, bluntly angled, 2–3 in. long, 1½–2¼ in. wide, dull olive-green with pale blotches, at length wrinkled, 1-foliate. *Leaves* thickly leathery, recurved, oblong or narrow-oblong, blunt, 7–8½ in. long, 2–2¾ in. wide, glaucous green, pruinose beneath, margin and midrib faintly purple, narrowed to the base. *Racemes* axillary, much contracted, clustered at the bases of the pseudobulbs, 4–5-flowered; bracts wide ovate, concave, ¾–1 in. long, acuminate and recurved at the tip; pedicels about ⅔ in. long. *Flowers* large, fleshy, odour unpleasant, yellowish-white with purple lines and blotches, the lip and the bases of the petals blood-red. *Sepals* about 1½–1¾ in. long; posterior obliquely erect, ovate, very acuminate, concave; lateral obliquely ovate, foliately recurved, acuminate. *Petals* clawed, ovate, subacute, undulate, under 1 in. long. *Lip* recurved, fleshy, elliptic-oblong, rather blunt, ½ in. long; disk sulcate, warted. *Column* wide, very short; wings ovate, falcately acuminate, over ¼ in. long; pollinia 2, obovoid.

Tab. 8842.—Fig. 1, petal; 2, lip and column; 3, anther-cap; 4, pollinia; 5, sketch of the entire plant:—*all enlarged except* 5, *which is much reduced.*

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M.S. del, J.N.F. lith.

Huth imp.

L. Reeve & Cº London.

Tab. 8843.

HOHERIA POPULNEA, var. LANCEOLATA.

New Zealand.

MALVACEAE. Tribe MALVEAE.

HOHERIA, *A. Cunn.; Benth. et Hook. f. Gen. Plant.* vol. i. p. 202.

Hoheria populnea, *A. Cunn. in Ann. Nat. Hist.* ser. i. vol. iii. p. 319 (1839); *Hook. Ic. Pl.* t. 565; *Hook. f. Fl. N. Zeal.* vol. i. p. 30, *et in Handb. N. Zeal. Fl.* p. 31; *Kirk, For. Fl. N. Zeal.* p. 87, tt. 53–55, *et in Students' Flora N. Zeal.* p. 71; *Cheeseman, Man. N. Zeal. Fl.* p. 78; *Gard. Chron.* (Suppl.) Nov. 23, 1901; *Bean, Trees and Shrubs*, vol. i. p. 621; **var. lanceolata**, *Hook. f. Fl. N. Zeal.* vol. i. p. 30; *E. A. Bowles in Garden*, 1919, vol. lxxxiii. p. 449, cum icon.; forma distinctior a varietate vulgari foliis lanceolatis floribus minoribus paucioribus segreganda.

Arbor parva, gracilis, 3–9-metralis, vel arbuscula; novelli pilis cinereis stellatis pubescentes. *Folia* alterna, persistentia, lanceolata vel ovato-lanceolata, apice acuminata, basi cuneata, margine dentibus gracilibus irregulariter grosse serrata, lamina 2·5–10 cm. longa, 1·2–3·5 cm. lata, glabra vel subtus parce stellato-pubescentia, supra nitide viridia; petiolus 6–12 mm. longus, stellato-pubescens. *Flores* fasciculati, in ramulorum hornotinorum axillis aestate prope exacta orti, singuli 2–2·5 cm. lati. *Calyx* cinereo-pubescens, turbinatus, 5-lobus; lobi triangulares, acuti, 2 mm. longi, maturi apice recurvi. *Petala* 5, candida, oblongo-obovata, saepius apicem versus inaequaliter lobata, 9–12 mm. longa, 6 mm. lata. *Stamina* plurima, in phalanges 5 aggregata; filamenta phalangium singularum inferne in columnam connata, superne libera; antherae luteae. *Ovarium* saepissime 5-loculare; ovula pro loculo solitaria; stigmata 5, capitata. *Fructus* e carpellis 5 alatis ad axim centralem adnatis compositus; alae pallide puniceae, membranaceae, oblique obovatae, 6 mm. longae, pilis stellatis pubescentes.—W. J. BEAN.

Hoheria populnea was originally discovered by Mr. C. Fraser in 1825, and again by Mr. R. Cunningham in 1833. Upon their specimens Mr. A. Cunningham founded the genus in 1839, adapting for it the native name for the tree, "houhere" or "hoihere." It occurs in both the North and South Islands of New Zealand. The genus is closely allied to *Plagianthus*, which differs from *Hoheria* in the often unisexual flowers, the linear decurrent stigmas and the solitary carpels. *H. populnea*, like so many New Zealand trees, is extremely variable, and whilst most authorities follow Sir J. D. Hooker in regarding the various forms as belonging to one species, others look upon them as constituting three or four

closely allied species. The differences are chiefly in the size and shape of the leaves, in the size of the flowers, and in the number of flowers in each fascicle. Mr. Kirk observes that the transition of one variety to another is so gradual that it is impossible to define lines of separation. The form now figured we regard as most nearly approaching Hooker's var. *lanceolata*, which differs from his var. *vulgaris* in its lanceolate leaves and smaller, fewer flowers. In var. *vulgaris* some leaves are as much as five inches long by two and a half inches wide. In a third variety (*angustifolia*, Hook. f.) many leaves are only an inch long by one-third of an inch wide. The most curious exhibition of heterophylly is, however, seen in occasional basal and apparently sterile shoots which bear leaves shaped like those of Hawthorn, many of them only from a quarter to half an inch long. Near London the *Hoheria* needs greenhouse or at least wall protection. It is hardy further south and along most of our western seaboard. The material for our figure was kindly furnished by Mr. R. Windsor Rickards, Usk Priory, Monmouth, to whom it had been given by Mr. H. A. Tipping, Mountain House, Chepstow, in whose garden it flowers in August. It is also cultivated in the gardens of Cornwall, Devon, Scilly Isles, etc., where it is one of the most graceful and attractive of late-flowering trees. It thrives in loamy soil and can be propagated by cuttings.

Description.—*Tree* of small size, 10–30 ft. high, and graceful habit, or a *shrub*; young shoots covered with a grey stellate pubescence. *Leaves* alternate, persistent, lanceolate to ovate-lanceolate, acuminate at the apex, cuneate at the base, coarsely and irregularly dentate, teeth slender; the blade 1–4 in. long, $\frac{1}{2}$–$1\frac{1}{2}$ in. wide, glabrous or with very scattered stellate pubescence beneath, rich lustrous green above; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. long, stellately pubescent. *Flowers* in fascicles, produced during late summer in the leaf-axils of the current season's twigs, $\frac{3}{4}$–1 in. diameter. *Calyx* grey-pubescent, turbinate, 5-lobed, the lobes triangular, acute, $\frac{1}{12}$ in. long, reflexed at the fruiting stage. *Petals* 5, snowy-white, oblong-obovate, often unevenly lobed towards the apex, $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{4}$ in. wide. *Stamens* numerous, arranged in 5 bundles, those of each bundle united below into a short column, separating above into slender filaments; anthers yellow. *Ovary* usually 5-celled, ovules solitary in each cell; stigmas 5, capitate. *Fruit* consisting of 5 winged carpels attached to a central axis; wings membranous, obliquely obovate, $\frac{1}{4}$ in. long, pinkish, and furnished with stellate pubescence.

Tab. 8843.—Fig. 1, flower-bud; 2, fully opened flower; 3, stamens of one phalanx; 4, pistil; 5, fruit; 6, a single carpel, in section; 7, seed; 8, embryo: —*all enlarged.*

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M.S. del. J.N.F. lith.

Huth imp.

L. Reeve & Cº London.

Tab. 8844.

IRIS Hoogiana.

Turkestan.

Iridaceae. Tribe Moraeeae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris (§ Regeliana) **Hoogiana**, *Dykes in Gard. Chron.* 1916, vol. lx. p. 216; affinis *I. Korolkowii*, Reg., et *I. stoloniferae*, Maxim., sed floribus concoloribus vix venosis distincta.

Herba rhizomate crebre in stolones saepe pluripollicares diviso. *Folia* ensata, levissime curvata, obtusiuscula, 35–45 cm. longa, ad 2 cm. lata, glauco-viridia, laevia. *Caulis* circiter 50 cm. altus, apice 2-3-florus. *Spathae* herbaceae viridesque praeter apicem et margines superiores membranaceos purpurascentesque, acute carinatae, 7–8·5 cm. longae. *Pedicelli* perbreves. *Perigonii* tubus viridis, purpureo-striatus, circiter 3 cm. longus, spatham aequans; segmenta exteriora limbo reflexo rotundato obovato obtusissimo 4·5 cm. longo 4 cm. lato concolore amoene lavandulaceo-violaceo cum ungue late cuneato 3 cm. longo pallidiore ad latera obscure venoso, barba ampla aurea 3·3 cm. longa paulo ultra unguem in limbum producta ibi attenuata et abrupte desinente; segmenta interiora erecta, lamina obovata acutiuscula in unguem brevem subangustum cuneatim contracta, eo incluso circiter 8 cm. longa, 4 cm. lata, eodem colore ac exteriora, barba tenui 2·5 cm. longa, aurea. *Antherae* filamentis paulo longiores, pallidae, polline albido. *Ovarium* oblongum, 2·5–3 cm. longum; styli rami late oblongi, colore floris communi, cristae lobis late semi-ovatis subintegris. *Capsula* elongata, apice attenuata. *Semina* pyriformia, brunnea, rugulosa, arillo conspicuo albido.—O. Stapf.

The handsome *Iris* here figured is a native of Turkestan, for the introduction of which horticulture is indebted to Mr. C. G. van Tubergen, the younger. Its earliest appearance in cultivation in this country dates from 1913, in which year rhizomes reached the garden of Mr. W. R. Dykes at Godalming, where it flowered for the first time in 1916, and whence the material for the present plate was contributed by Mr. Dykes in May, 1919. When describing the species on the occasion of its first making blossom, Mr. Dykes pointed out that it is a member of the section *Regeliana*, in foliage closely resembling *I. Korolkowii*, Reg., from Turkestan (figured at t. 7025 of this work), and *I. stolonifera*, Maxim., from

Kokan, two well-known species of the same group, with rootstocks that spread even more rapidly by stolons than the former, though hardly to be distinguished, when in a dormant condition, from those of the latter. This new *Iris* Mr. Dykes has dedicated to the Messrs. Hoog, nephews of its introducer, and now the heads of the famous establishment at Haarlem whence it was received by him. Like other members of the same section as *I. Hoogiana*, Mr. Dykes finds that its rhizomes, if they are to remain firm and plump, should not be taken up before the middle of July. One of the more pronounced features of this *Iris* is the uniform colouring of all parts of the flower, with the exception of the rich golden-yellow beard. The general colour is lavender in the fully opened flower, though the shade appears to vary slightly, and in his original account of the plant Mr. Dykes states, on the authority of Mr. Hoog, that white-flowered specimens occur in the original stock.

Description.—*Herb* with the rhizome emitting numerous stolons which are often of considerable length. *Leaves* ensate, slightly curved, somewhat blunt, 14–18 in. long, up to ¾ in. wide, glaucous-green, smooth. *Stem* about 20 in. high, 2–3-flowered at the top. *Spathes* herbaceous, green except at the tip and along the upper portion of the membranous margin where they are flushed with purple, sharply keeled, 2½–3½ in. *Pedicels* very short. *Perianth-tube* green, streaked with purple, about 1¼ in. long, reaching the top of the spathe; outer segments with a reflexed rounded-obovate quite blunt, uniformly clear lavender-violet limb, 1¾ in. long, 1½ in. wide, and with a wide cuneate claw 1¼ in. long, of a paler lavender, indistinctly veined at the sides, beard copious, golden yellow, extending almost for 1½ in. somewhat beyond the claw on to the limb, where it becomes thinner and ends abruptly; inner segments erect, with an obovate somewhat acute limb gradually narrowed downwards to a short rather narrow claw, including the claw over 3 in. long, 1½ in. wide, uniform in colour with the outer segments, beard scanty, golden yellow, extending about 1 in. *Anthers* slightly longer than the filaments, pale in colour, with whitish pollen. *Ovary* oblong, 1–1½ in. long; style-arms wide-oblong, lavender; crests with broadly semi-ovate, almost entire lobes. *Capsule* elongated, narrowed to the tip. *Seeds* pyriform, brown, rugulose, with a conspicuous whitish aril.

Tab. 8844.—Fig. 1 and 2, anthers; 3, stigma:—*all enlarged.*

M.S. del. J.N.F. lith.

Huth imp

L. Reeve & Cº London.

Tab. 8845.

VENIDIUM macrocephalum.

South Africa.

Compositae. Tribe Arctotideae.

Venidium, *Less.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 459.

Venidium macrocephalum, *DC. Prodr.* vol. vi. p. 494. (1837); *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 463 (1865); affinis *V. Wylei*, Harv., sed planta hirsuta nec lanata, capitulis majoribus differt.

Herba annua. *Caulis* simplex, uniflorus, usque ad 4 dm. altus, herbaceus, pilis multilocellatis parce pubescens, basin versus parce foliatus. *Folia* inferiora longe petiolata, lyrato-pinnatilobata, 15–20 cm. longa, superiora sessilia, elliptica vel oblongo-elliptica, basi obtusa vel subtruncata, apice obtusa, 4–5·5 cm. longa, 1·5–3 cm. lata, chartacea, lobata vel integra, infra praesertim in nervis pilosa, basi trinervia nervis ascendentibus infra prominentibus; petioli usque ad 8 cm. longi. *Capitula* circiter 8 cm. expansa. *Involucri* bracteae 3–4-seriatae, exteriores laxae, angustae, interiores confertae, late lanceolatae, acutae, longe ciliatae, gradatim longiores. *Receptaculum* leviter convexum, 2 cm. diametro, fimbrilliferum. *Flores radii* flavi, basi rubescentes, subbiseriati; corollae tubus 4 mm. longus, parce pubescens; limbus anguste oblanceolatus, apice integer, 2·5–3 cm. longus, 0·5–0·7 cm. latus, 4-nervius; stylus exsertus, bilobus. *Flores disci* numerosi, viridescentes; corollae tubus 4 mm. longus, apicem versus leviter ampliatus, extra setuloso-pubescens; lobi 5, ovati, subacuti, incrassati et dorso complanati, glabri; antherae leviter exsertae; styli rami ultra medium concreti, basi leviter pubescentes. *Achaenia* glabra, longitudinaliter costata, paleis minutissimis hyalinis ovatis coronata.—J. Hutchinson.

The Composite genus *Venidium*, established by Lessing in 1831, includes some five and twenty species, all of them natives of South Africa. It is closely allied to *Arctotis*, a genus recognised by Linnaeus, and has, in fact, been united therewith by authorities so competent as Hoffmann and Beauverd. Bentham, however, relying on characters derived from the achenes and the pappus, has followed Lessing and Decandolle, and Mr. Hutchinson, who has prepared the description that precedes this note. finds himself, after a critical scrutiny of the species of this and other allied genera, able to confirm the validity of the conclusions arrived at by Bentham. The absence

or extreme reduction of the pappus in *Venidium* renders its separation from *Arctotis* as easy as it is essential. The beautiful species now figured shares with a number of other *Compositae* that possess large and showy flower-heads the popular name "Gouws bloem." It has been determined, from the original description, to be the species named by Decandolle *V. macrocephalum*, which would appear to be extremely rare, for the only previous record of its collection is that by Drège, who found it in South-west Africa, between Kaus and the Orange River. The plant figured was raised at Kew from seed sent from Pretoria by Dr. I. B. Pole Evans in the spring of 1918. It flowered in August of the same year, but unfortunately failed to ripen its seeds at Kew.

DESCRIPTION.—*Herb* with a simple annual 1-flowered stem, 1½ ft. high, sparingly pubescent throughout with many-celled hairs, sparsely leafy low down. *Leaves* nearest the ground long petioled, lyrately pinnately lobed, 6–8 in. long, those higher up sessile, elliptic or oblong-elliptic, rounded or subtruncate at the base, blunt at the tip, 1¾–2¼ in. long, ⅔–1¼ in. wide, papery, lobed or entire, pilose, especially along the nerves beneath, 3-nerved at the base with the nerves ascending and raised beneath; petiole of the lower leaves up to 3 in. long. *Heads* about 3 in. wide; involucral bracts 3–4-seriate, the outer loose and narrow, the inner close-set, wide lanceolate, acute, long ciliate and gradually longer from without inwards. *Receptacle* slightly convex, ¾ in. across, fimbrillate. *Ray-florets* yellow with reddish base, obscurely 2-seriate; tube of the corolla ⅙ in. long, sparingly pubescent; limb narrow lanceolate, entire at the tip, 1–1¼ in. long, about ¼ in. wide, 4-nerved; style exserted, 2-lobed. *Disk-florets* very many, greenish; tube of the corolla ⅙ in. long, slightly widened towards the top, sparingly setulose outside; lobes 5, ovate, subacute, thickened and flattened on the outside, glabrous; anthers slightly exserted; style-arms united beyond the middle, slightly pubescent at the base. *Achenes* smooth, longitudinally ribbed, crowned by the very minute, hyaline, ovate pales.

TAB. 8845.—Fig. 1, part of receptacle with young disk-florets; 2, ray-floret; 3, disk-floret; 4, anthers; 5, style-arms of a disk-floret:—*all enlarged*.

M.S. del. J.N.F. lith.

Huth imp

L. Reeve & Cº London.

Tab. 8846.

METROSIDEROS collina.

Polynesia.

Myrtaceae. Tribe Myrteae.

Metrosideros, *Banks*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 710.

Metrosideros collina, *A. Gray, Bot. U. St. Expl. Exped.* vol. i. p. 558 (1854); *Nadeaud, Enum. Pl. Tahit.* p. 78; *Rock, Revis. Haw. Sp. Metrosid.* p. 15; a *M. tomentosa*, A. Rich., floribus minoribus et foliis saepissime latioribus differt.

Arbor vel *frutex* altus. *Rami* teretes, primum saepissime villosi, demum glabrati. *Folia* opposita, breviter petiolata, coriacea, obovata, late elliptica vel suborbiculata, obtusa, basi cuneata vel rotundata, villosa vel glabra, 3-6 cm. longa, 2–4 cm. lata; venis numerosis parallelis; petioli 0·5–1 cm. longi. *Flores* terminales, speciosi, in corymbos vel paniculas arctius aggregati; bracteae subobsoletae; pedicelli breves, tomentosi. *Calyx* campanulatus, 3–5 mm. longus, tomentosus; lobi late oblongi vel rotundati, 2 mm. longi. *Petala* obovata, 4–5 mm. longa, rubra. *Stamina* numerosa, 1·5–2 cm. longa. *Stylus* gracilis, 2 cm. longus.—*Leptospermum collinum*, Forst. Char. Gen. Plant. p. 72 (1776). *Melaleuca villosa*, Linn. Suppl. Plant. p. 342 (1781). *M. aestuosa*, Forst. f. Prodr. p. 38 (1786). *Metrosideros villosa*, Smith in Trans. Linn. Soc. vol. iii. p. 268 (1797); T. Kirk, Students' Fl. N. Zeal. p. 163; Cheesem. Man. N. Zeal. Fl. p. 167; R. B. Oliver, in Trans. N. Zeal. Inst. vol. xlii. p. 168. *M. polymorpha*, Gaud. in Freyc. Voy. Bot. p. 482, tt. 108, 109 (1826); Hook. f. Handb. N. Zeal. Fl. p. 73; T. Kirk, Forest Fl. N. Zeal. p. 241, t. 119; Sincl. Fl. Haw. Isl. t. 2; Hillebr. Fl. Haw. Isl. 125.—R. A. Rolfe.

The Myrtaceous genus *Metrosideros* is widely distributed throughout Polynesia and is well represented in New Zealand. The species now figured, *M. collina*, though not one of the New Zealand members of the genus, is most nearly allied to *M. tomentosa*, A. Rich., known in New Zealand as the Christmas Tree and figured at t. 4488 of this work. The history of our plant is somewhat complicated, a circumstance attributable partly to its very wide distribution, partly to the variability it displays. It was first briefly characterised by Forster

in 1776 as *Leptospermum collinum*, from specimens the exact provenance of which is unknown, and was diagnosed by him a second time as *Melaleuca aestuosa*, from Tahiti material. Later this species was united with the Hawaiian *Metrosideros polymorpha* of Gaudichaud, now reported from many other Polynesian groups. Recently, however, Mr. J. F. Rock, Government Botanist of the Sandwich Islands, after a careful study of the Hawaiian *Metrosideros*, has reached the conclusion that *M. polymorpha* includes five species, four of these being endemic in the group, while the fifth is the widespread *M. collina*. But Mr. Rock finds further that in the Sandwich Islands *M. collina* itself includes eleven recognisable varieties, nine of which are endemic, while the remaining two, var. *glaberrima* and var. *incana*, are distributed. The form recognised as var. *incana* is, however, at once the Linnaean *Melaleuca villosa* and the original *Leptospermum collinum* of Forster which we now figure. This particular form extends from Lord Howe Island and New Caledonia eastward to Pitcairn Island and Tahiti and northward to Hawaii. For the introduction of *M. collina* to European gardens, horticulture is indebted to Major A. A. Dorrien-Smith, from whose garden at Tresco Abbey, Isles of Scilly, came the material for our figure. To Tresco Major Dorrien-Smith brought his plant from Wellington, New Zealand, whither it had been introduced from Sunday Island in the Kermadec Group by Mr. R. B. Oliver. It thrives satisfactorily in the Scilly Islands, where it flowered in June, 1918, and may prove hardy in other especially favoured situations in the south-west of England and Ireland.

DESCRIPTION.—*Tree*, up to 60 ft. high, or at times a *shrub*; branches terete, at first usually hairy, ultimately becoming glabrous. *Leaves* opposite, shortly stalked, leathery, obovate, wide elliptic or nearly orbicular, blunt at the apex, cuneate or rounded at the base, villous or glabrous, $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{2}$ in. wide; veins many, parallel; petiole $\frac{1}{5}$–$\frac{2}{5}$ in. long. *Flowers* terminal, showy, rather closely corymbose or paniculate; bracts almost obsolete; pedicels short, tomentose. *Calyx* campanulate, $\frac{1}{8}$–$\frac{1}{5}$ in. long, tomentose; lobes wide, oblong or rounded, $\frac{1}{12}$ in. long. *Petals* obovate, $\frac{1}{6}$–$\frac{1}{5}$ in. long, red. *Stamens* numerous, $\frac{2}{3}$–$\frac{3}{4}$ in. long. *Style* slender, $\frac{3}{4}$ in. long.

TAB. 8846.—Fig. 1, base of leaf; 2, calyx and pistil; 3, section of calyx and ovary; 4, petal; 5 and 6, anthers:—*all enlarged*.

M.S. del. J.N.F. lith.

Huth imp.

L. Reeve & Cº London

Tab. 8847.

LILIUM Farreri.

China.

Liliaceae. Tribe Tulipeae.

Lilium, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 816.

Lilium (§ Martagon) **Farreri**, *Turrill in Gard. Chron.* 1919, vol. lxvi. p. 76; species *L. Duchartrei*, Franch., affinis, sed floribus minoribus solitariis vel in umbellam aggregatis, perianthii segmentis revolutis inferne viridibus praecipue distinguitur.

Rhizoma horizontaliter repens, undulatum, circiter 2 mm. diametro, album, ad nodos bulbiferum, internodiis usque ad 7·5 cm. longis nudis; bulbi juniores late ovoidei, acuti, usque ad 1·4 cm. longi et 1·3 cm. diametro, squamis paucis latis crassis laxe vel arcte imbricatis. *Caulis* erectus, usque ad 8 dm. altus, rigidus, viridis, inferne cellularum bullatarum lineis longitudinalibus praeditus, interdum in foliorum et bractearum axillis pilis albis floccoso-barbatus, interdum glaber. *Folia* caulina numerosa, per caulis longitudinem dispersa, lineari-oblanceolata, apice acuta, basi gradatim angustata, 8·5 cm. longa, 1 cm. lata, nervis principalibus 3–5, pagina utraque glabra, margine cellularum bullatarum lineis instructa. *Flores* solitarii vel 6 in umbellam laxam aggregati, odoratissimi; bracteae (folia floralia) verticillatae, anguste elliptico-lanceolatae, apice acutae, basi gradatim angustatae, circiter 2·5 cm. longae et 7 mm. latae, glabrae; pedicelli 7·5–15 cm. longi, ad insertionem bracteolae nunc albo-floccosi nunc glabri; bracteola singula prope pedicelli medium posita, bracteis simillima nisi minor et angustior. *Perianthii segmenta* revoluta, lanceolata, exteriora apice acuta, interiora obtusa, 5·5 cm. longa, 1·1 cm. lata, alba, a basi usque ad medium maculis atro-purpureis instructa, inferne tubum viridem circiter 1 cm. longum formantia, apice pilosula, in pagina superiore inferne sulco nectarifero lineis duabus papillosis praedito instructa ceterum glabra. *Stamina* gynoecio parum breviora; filamenta subulata, inferne complanata, circiter 3·3 cm. longa, extrorsum curvata, glabra; antherae 8–10 mm. longae fulvae. *Ovarium* cylindricum, 1–4 cm. altum, 3 mm. diametro, longitudinaliter sulcatum, glabrum, viride; stylus superne gradatim incrassatus, extrorsum curvatus, fere 3 cm. longus, glaber, viridis. *Capsula* oblonga, triangularis, breviter stipitata, 3·2 cm. lata, 2·2 cm. diametro.—W. B. Turrill.

The Chinese lily now figured is a member of the *Martagon* group of the genus *Lilium*, raised by Major F. C. Stern, at Highdown, Goring-by-Sea, Sussex, from seeds received by him from China in 1915, from Mr. Reginald Farrer, with the indication that this particular batch consisted of "a mixed lot of poor seed

of undecipherable small lilies." Whatever the other components of this seed-packet may prove to be, it is interesting to know that of the species included therein one proves to be new to cultivation and to science, and possesses intrinsic merits that justify its dedication to the distinguished traveller and cultivator to whose efforts its introduction to our gardens is primarily due. In the *Martagon* group, our plant, which has been figured from material placed at our service by Major Stern, is clearly a near ally of *L. Duchartrei*, Franch., figured at t. 8072 of this work. The features which especially characterise *L. Farreri* are its linear-lanceolate cauline leaves which are disposed throughout the greater part of the stem, and its relatively small flowers whose revolute perianth-segments are white with dark purple spots. In the lower portion of the flower these segments converge to form a tube under half an inch in length. The flowers are very strongly but pleasantly scented. Major Stern informs us that very little seed of this species was received. This seed was sown in March, 1915, in ordinary garden soil which, at Highdown, is particularly full of lime. The plants raised have proved quite hardy, and flowered with Major Stern for the first time in 1917, beginning in July and continuing in flower till August. They appear to thrive equally well in garden plots and in pots, calling for a fairly dry situation and good drainage. The plants fruit very freely, and the seeds ripen satisfactorily in the open air. The material for our plate was received from Major Stern in July, 1919, and in all the specimens so far communicated the inflorescence has been either strictly umbellate or reduced to a single terminal flower. A character which appears to be variable in *L. Farreri* is the presence of tufts of white hairs at the nodes. In the example figured these were very marked, but in other specimens subsequently received the leaves and stems are quite glabrous, so that in this respect *L. Farreri* shares a peculiarity which, as Professor Bayley Balfour has pointed out, is well seen in the *Nomocharis* group, where hairs may be present on or absent from the nodes in the same species. There would also seem to be some degree of variation in the size and shape of the capsules, some of

those received being larger and narrower than that now figured and described.

DESCRIPTION.—*Herb* with an undulately creeping horizontal rootstock about $\frac{1}{12}$ in. thick, with white naked internodes up to 3 in. long, bulbiferous at the nodes; young bulbs wide ovoid, acute, over $\frac{1}{2}$ in. long and nearly as thick, loosely or closely clothed with a few broad thick scales. *Stem* erect, $2\frac{1}{2}$–$2\frac{3}{4}$ ft. high, firm, green, below marked with longitudinal lines of bullate cells, sometimes floccose with white hairs in the axils of the leaves and bracts, sometimes quite glabrous. *Leaves* many, scattered throughout the whole length of the stem, linear-oblanceolate, acute, gradually narrowed to the base, $3\frac{1}{2}$ in. long, over $\frac{1}{3}$ in. wide, with 3–5 main-veins, glabrous on both surfaces and with a marginal line of bullate cells. *Flowers* terminal, solitary or aggregated in a loose 6-flowered umbel, very fragrant; bracts (floral leaves) verticillate, narrow elliptic-oblanceolate, acute, gradually narrowed to the base, about 1 in. long, over $\frac{1}{4}$ in. wide, glabrous; pedicels 3–6 in. long, sometimes white-floccose, sometimes glabrous at the point of origin of the solitary bracteole which is attached near the middle of the pedicel and resembles the bracts save for being smaller and narrower. *Perianth-segments* revolute, lanceolate, the outer acute, the inner obtuse, over 2 in. long, nearly $\frac{1}{2}$ in. wide, white with dark purple blotches in the lower half, forming at the base a green tube less than $\frac{1}{2}$ in. long, finely pilose at the tip and with a nectarial groove provided with two papillose lines near the base on the upper surface, elsewhere glabrous. *Stamens* rather shorter than the pistil; filaments subulate, flattened near the base, about $1\frac{1}{2}$ in. long, curving outwards, glabrous; anthers about $\frac{1}{3}$ in. long, tawny. *Ovary* cylindric, over $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. across, longitudinally sulcate, glabrous, green; style gradually thickened upwards, curved outwards, about $1\frac{1}{4}$ in. long, glabrous, green. *Capsule* oblong, triangular, shortly stipitate, $1\frac{1}{4}$ in. long, nearly 1 in. wide.

TAB. 8847.—Fig. 1, base of leaf; 2 and 3, anthers; 4, pistil; 5, fruit:—*all enlarged except* 5, *which is of natural size.*

M.S. del, A.W.D lith.

L. Reeve & C° London.

Tab. 8848.

SALVIA brevilabra.

China.

Labiatae. Tribe Monardeae.

Salvia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1194.

Salvia brevilabra, *Franch. in Bull. Soc. Phil. Paris*, 8me sér. vol. iii. p. 149; *Dunn in Notes R. Bot. Gard. Edinb.* vol. vi. p. 164, partim; species *S. hianti*, Royle, valde affinis, sed floribus minoribus et corollae labiis brevibus praesertim differt.

Herba perennis. *Caules* erecti, usque ad 0·6 m. alti, sat crassi, parce pilosi. *Folia* radicalia et caulina inferiora longe petiolata, superiora breviter petiolata, ovata vel anguste ovata, apice acuta, basi cordata vel hastata, irregulariter grosse crenata vel bicrenata, basin versus interdum leviter lobata, ad 11 cm. longa, basi 5–7 cm. lata, utrinque viridia et pilis paulum rigidis brevibus subtus praesertim ad venas vestita; petioli foliorum inferiorum ad 13 cm. longi, superiorum 0·5–2·5 cm. longi. *Inflorescentia* ad 13 cm. longa, basi ramosa. *Verticillastri* 2–5 cm. distantes, 2–6-flori. *Bracteae* ovatae, ovato-lanceolatae vel suborbiculares, acutae vel acuminatae, pedicellis subaequilongae vel paulum longiores. *Pedicelli* 2–6 mm. longi. *Calyx* campanulatus, 1 cm. longus, conspicue nervosus, pilis brevibus cum paucis longioribus intermixtis saepissime glandulosis dense vestitus; labium posticum semi-orbiculare, circiter 5 mm. longum, basi 8 mm. latum, minute 3-dentatum; labium anticum circiter 6 mm. longum, 2-lobum; lobi ovati, breviter acuminati, 5 mm. longi. *Corolla* circiter 2·5 cm. longa, violacea, labio antico maculis albis elongatis notato; tubus tubuloso-campanulatus, superne ventricosus, circiter 2 cm. longus, supra medium 5–6 mm. latus, intus prope basin conspicue piloso-annulatus; labium posticum circiter 5 mm. longum et 8 mm. latum, profunde emarginatum; labium anticum 3-lobum, 1 cm. longum; lobus intermedius major, late obovatus, emarginatus, 5 mm. longus, 6–7 mm. latus. *Stamina* paulum exserta; staminodia 2, 2·5 mm. longa. *Nuculae* glabrae, subellipsoideae, 0·75 mm. longae, basi disco crasso antice tumidiore circumdatae; stylus vix exsertus, valde inaequaliter 2-fidus. —*S. Souliei*, Duthie ex J. H. Veitch, Hort. Veitch. p. 434; J. Veitch and Sons, Novelties for 1907, p. 11, with fig.; The Garden, 1907, vol. lxxi. p. 237; non Leveillé.—S. A. Skan.

The Chinese *Salvia* described by the late Mr. Franchet as *S. brevilabra* was first collected near Ta-chien-lu in Western Szechuan by Père Soulié and was sent by him in 1890–91 to the Paris Museum. We have not had access to the original type with which Mr. Dunn has identified, from its description, the plant now figured, which was met with in the original locality some fourteen years later by Mr. E. H. Wilson, and was raised from

Wilson's seeds by Messrs. James Veitch and Sons in their nursery at Coombe Wood, where it flowered for the first time in 1905, and was then regarded by Mr. Duthie as an undescribed species which he named *S. brevilabra* owing to his having identified it with a specimen in the Kew herbarium issued as Soulie, n. 97. This latter plant has, however, been described by the late Mr. Leveillé as *S. Blinii*, and although Dunn has reduced *S. Blinii* to *S. brevilabra*, it is not altogether certain that Leveillé's plant is identical with that of Wilson. The plant which Leveillé had before him differs from the one now figured in having less coarsely toothed leaves, densely covered on the undersurface with a rather short grey pubescence. These features characterise specimens obtained by Mr. Pratt and issued as Pratt, n. 214, which are included in *S. brevilabra* by Dunn. There are thus certainly two readily distinguishable, if closely allied forms of *Salvia* to be found growing at elevations of 10–12,000 feet in the neighbourhood of Ta-chien-lu, and under the circumstances it seems desirable to regard them as specifically distinct. Both species are equally closely allied to the Kashmir species, *S. hians*, Royle, figured at t. 6517 of this work, which differs mainly from *S. brevilabra* in having much larger corollas with longer lips, and in having leaves which are usually more regularly and less coarsely toothed. Plants of *S. brevilabra*, received from Messrs. Veitch under the name *S. Souliei*, have been in cultivation at Kew for the past twelve years. At Kew it has proved a hardy perennial, flowering about midsummer and ripening its seeds. The material for our plate has been supplied by Mr. H. J. Elwes, in whose garden at Colesborne, Cheltenham, it grows equally satisfactorily and has proved equally hardy.

Description.—*Herb*, perennial; stems erect, about 2 ft. high, rather stout, sparingly hairy. *Leaves* of the crown and on the lower portion of the stem long stalked, the uppermost leaves more shortly petioled, all ovate or narrow ovate, acute, cordate or hastate at the base, irregularly coarsely crenate or twice crenate, sometimes slightly lobed near the base, up to $4\frac{1}{2}$ in. long, 2–3 in. across at the base, green on both surfaces and beneath with a few rigid short hairs especially on the nerves; petiole of lower leaves over 5 in. long, of upper leaves $\frac{1}{4}$–1 in. long. *Inflorescence* over 5 in. long, branched at the base; verticillasters $\frac{3}{4}$–2 in. apart, 2–6-flowered; bracts ovate, ovate-lanceolate or nearly orbicular, acute or acuminate, about as long as, or rather longer than the pedicels which are from $\frac{1}{12}$–$\frac{1}{4}$ in. long. *Calyx* campanulate, about

$\frac{1}{3}$ in. long, distinctly veined, densely clothed with short, usually glandular hairs with a few longer intermixed; upper lip semi-orbicular, about $\frac{1}{5}$ in. long, $\frac{1}{3}$ in. wide at the base, minutely 3-dentate; lower lip about $\frac{1}{4}$ in. long, 2-lobed, the lobes ovate, shortly acuminate, $\frac{1}{5}$ in. long. *Corolla* about 1 in. long, violet, the lower lip streaked with long white blotches; tube narrowly campanulate, ventricose towards the top, about $\frac{3}{4}$ in. long, above the middle $\frac{1}{5}$—$\frac{1}{6}$ in. wide, with a conspicuous ring of hairs near the base within; upper lip about $\frac{1}{5}$ in. long, $\frac{1}{3}$ in. wide, deeply emarginate; lower lip 3-lobed, over $\frac{1}{3}$ in. long, the mid-lobe larger than the lateral, wide obovate, emarginate, $\frac{1}{5}$ in. long, $\frac{1}{4}$ in. wide or rather wider. *Stamens* slightly exserted; staminodes 2, $\frac{1}{10}$ in. long. *Nutlets* glabrous, nearly ellipsoid, very small, surrounded at the base by a thick disk more swollen in front; style hardly exserted, very unequally 2-fid.

Tab. 8848.—Fig. 1, calyx and pistil; 2, corolla, laid open; 3, anthers, with portion of filaments; 4, ovary, disk and lower part of style :—*all enlarged*.

6

1 2 3 4 5

M.S. del. A.W.D. lith

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Tab. 8849.

RIBES niveum.

North-west America.

Saxifragaceae. Tribe Ribesieae.

Ribes, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 654.

Ribes niveum, *Lindl., Bot. Reg.* t. 1692; *Loudon, Encyc. Trees & Shrubs,* p. 470, fig. 845; *Eastwood in Proc. Calif. Acad.* ser. 3, vol. ii. p. 251; *Heller in Muhlenbergia,* vol. i. p. 64; *Schneid. Handb. Laubholzk.* vol. i. p. 409, figs. 262, h–l; 263, d. e., partim; *Jancz. Monogr. Grosseill. in Mem. Soc. Phys. & Hist. Nat. Genève,* vol. xxxv. 393; species *R. divaricato,* Douglas, affinis, sed sepalis albis longioribus, filamentis pilosis diversa.

Frutex 3-metralis, ramulis hincinde ad nodos aculeis plerumque 1–3 validiusculis circiter 1 cm. longis armatis vel inermibus, rarius in surculis robustis parce aculeolatis. *Gemmae* oblongae, 5 mm. longae; perulae exteriores subcoriaceae, brunneae, triangulari-ovatae, subacutae, interiores scariosae, elongatae, pallidae, glabrae. *Folia* in macrocladiis sparsa, in brachycladiis brevissimis arcte fasciculata, petiolo longitudine valde vario plerumque 1–2 cm. interdum vero ultra 4 cm. longo suffulta; lamina ambitu rotundata, basi truncata vel latissime cuneata, breviter 3–5-loba, 2–3 cm. longa, 2·5–3·5 lata, lobis obtusis grosse crenatis, basin versus et secus margines parce pubescentia, caeterum glabra, raro subtus undique molliter pilosula. *Racemi* graciles, subpenduli, 3–4-flori, axi 1–1·5 (interdum ad 2·5) cm. longi pedunculo plerumque brevi incluso; bracteae submembranaceae, obovato-ellipticae, interdum lobulatae, glabrae vel parce ciliolatae, 2 mm. longae, pedicellorum bases manicae modo circumdantes. *Receptaculum* inferum ellipsoideum, superum infundibuliforme, 2 mm. longum, totum glabrum. *Sepala* anguste oblonga, obtusa, 8–9 mm. longa, alba, basi roseo-tincta, sub anthesi patula, deinde recurva. *Petala* obovato-spathulata, 2 mm. longa, porrecta. *Stamina* longe exserta; filamenta 8 mm. longa, patule pilosa; antherae rotundatae, 1 mm. longae. *Stylus* antheras paulo superans, ad 1·5 mm. bifidus, patule pilosus. *Fructus* globosus, 8–9 mm. diametro, glaber, atropurpureus, calyce persistente coronatus.—*R. gracile,* Torr. & Gray, Fl. N. Am. vol. i. p. 546; S. Watson, Bibl. Ind. N. Am. Bot. p. 333, pro parte; Wilks, Journ. D. Dougl. 335; Howell, Fl. N.W. Am. vol. i. p. 210; Eastwood in Proc. Cal. Acad. 3, ser. 3, vol. ii. p. 241; Heller in Muhlenbergia, vol. i. p. 63. *R. divaricatum,* Hook. in London Journ. Bot. vol. vi. p. 229; non Dougl. *Grossularia nivea,* Spach, Hist. Vég. Phan. vol. vi. p. 179.—O. Stapf.

The Gooseberry now figured, for the material of which we are indebted to the Rev. W. E. Blathwayt, Dyrham Rectory, Chippenham, is one that has long been known in cultivation in this country. According to Loudon,

it was introduced into the garden of the Royal Horticultural Society about 1826 and its first discovery was made by Mr. David Douglas, somewhere in Northwest America, probably in Oregon or in Washington, though the precise locality in which it was originally gathered can no longer be traced with certainty. There are two specimens of *Ribes niveum* in the herbarium at Kew which are attributed to Douglas. One of these is written up as "Hort. Soc. Ribes like irriguum," and is noted as "drawn for Bot. Reg.," so that it is probably from a plant raised from seed received from Douglas. The other bears the legend "117 Ribes triflorum, August 5, 1834. Woods on banks of Columbia." But the label is not in the handwriting of Douglas, and if the date be correct the specimen cannot be connected with this distinguished collector who was killed in the Sandwich Islands on 12 June, 1834. It is, however, possible that *R. niveum* may have been one of the "interesting species of *Ribes*" mentioned by Douglas in his Journal (p. 60), and if so it came from "the mountain on the south side of the river"—the Columbia—in the neighbourhood of the Grand Rapids, where he collected in the early part of September, 1825. The whole of the remaining references by Douglas to *Ribes*, and these are numerous in his Journal, appear to be excluded for various reasons which it is not necessary to detail. The area occupied by the species extends throughout Idaho, Oregon, and Washington, where it is found at altitudes up to 3,000 feet. It was in America at first confused with *R. gracile*, Michx, an eastern species first observed in Tennessee, whence it extends to Illinois, Kansas, and Texas. *R. niveum* is interesting as one of the few Gooseberries in which the flowers are white. It is also one of the most ornamental. It is easily grown in any soil of moderate quality and is readily propagated by cuttings. It has been grown at Kew for at least three quarters of a century and is perfectly hardy. The fruits are edible and well-flavoured when cooked.

Description.—*Shrub*, 10 ft. high, twigs casually armed with usually 1–3 stoutish prickles about $\frac{1}{3}$ in. long, or unarmed; stout suckers rarely sparingly prickly. *Buds* oblong, $\frac{1}{5}$ in. long; outer bud-scales somewhat leathery, brown, triangular-ovate, rather acute; inner scales scarious, elongated, pale-

coloured, glabrous. *Leaves* of long shoots scattered, those of the much contracted short shoots densely clustered; petiole very variable in length, usually $\frac{1}{3}$–$\frac{3}{4}$ in., but at times over $1\frac{1}{2}$ in. long; blade rounded in outline with a truncate or wide-cuneate base, shortly 3–5-lobed, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, 1–$1\frac{1}{2}$ in. wide, lobes blunt and coarsely toothed, sparingly pubescent towards the base and margin, elsewhere glabrous, rarely uniformly softly hairy beneath. *Racemes* slender, somewhat pendulous, 3–4-flowered, including the short peduncle $\frac{2}{5}$–$\frac{2}{3}$ in. or occasionally 1 in. long; bracts rather membranous, obovate-elliptic; sometimes lobulate, glabrous or sparingly ciliolate, $\frac{1}{12}$ in. long, enveloping the base of the pedicel. *Receptacle* ellipsoid below, funnel-shaped above, $\frac{1}{12}$ in. long, quite glabrous. *Sepals* narrow-oblong, blunt, about $\frac{1}{3}$ in. long, white tinged with rose near the base, in flower spreading, eventually recurved. *Petals* obovate-spathulate, $\frac{1}{12}$ in. long, nearly straight. *Stamens* far exserted; filaments $\frac{1}{3}$ in. long, beset with spreading hairs; anthers rounded. *Style* slightly longer than the stamens, 2-fid in the upper sixth, beset with spreading hairs. *Berry* globose, about $\frac{1}{3}$ in. wide, glabrous, dark-purple, crowned by the persistent calyx.

Tab. 8849.—Fig. 1, basal portion of leaf; 2, flower; 3, section of flower; 4 and 5, anthers; 6, fruiting twig:—*all enlarged except* 6, *which is of natural size*.

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Tab. 8850.

PODOPHYLLUM Emodi, var. chinense.

Western China.

Berberidaceae. Tribe Berberideae.

Podophyllum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 45.

Podophyllum Emodi, *Wall. Cat.* n. 814 (1829); *Hook. f. et Thoms. in Hook. f. Fl. Brit. Ind.* vol. i. p. 112; var. **chinense**, *Sprague*; foliis pedatim quinquepartitis vel tripartitis, segmentis omnibus tripartitis, floribus roseis distinguitur.

Herba, rhizomate crasso horizontali folia et caules erectos annuos floriferos emittente perennans. *Radices* numerosae, carnosae, adventitiae, ad 2 dm. longae. *Caules* floriferi carnosi, 2·5–5 dm. longi, 0·8–1 cm. diametro, basi foliis pluribus cataphyllaribus vaginati, superne 2–3-foliati, internodiis sub anthesi 0·5–1·5 cm. longis, apice uniflori. *Folia* caulina petiolata, basi cordata, fere ad basin tripartita vel pedatim quinquepartita, segmentis ad medium trifidis, lobis ultimis acuminatis, sub anthesi petiolis erectis pedunculo appressis, laminis more involucri apicem pedunculi circumdantibus deflexis parum expansis brunneo-variegatis, supra nervis venisque impressis, subtus breviter albo-villosis, nervis venisque prominentibus; folia caulina sub fructu expanso, circiter 2·5 dm. diametro. *Sepala* fugacia, verosimiliter 6 (a nobis haud visa). *Petala* 6, ascendentia, obovata, rosea, margine undulata, 3 exteriora 4 cm. longa, 2·5–3·3 cm. lata, 3 interiora paullo minora. *Stamina* 6; filamenta incurva, 8–9 mm. longa; antherae anguste oblongae, obtusae, 7–8 mm. longae, lateraliter dehiscentes, connectivo lato. *Ovarium* oblique ovoideum, circiter 1 cm. longum, sutura ventrali conspicue sulcata; stylus brevis; stigma pluri-lobatum lobis suborbicularibus irregulariter imbricatis. *Ovula* perplurima, placentae crassae carnosae valde intrusae affixa. *Bacca* ovoidea, circiter 5 cm. longa, rubra.

—T. A. Sprague.

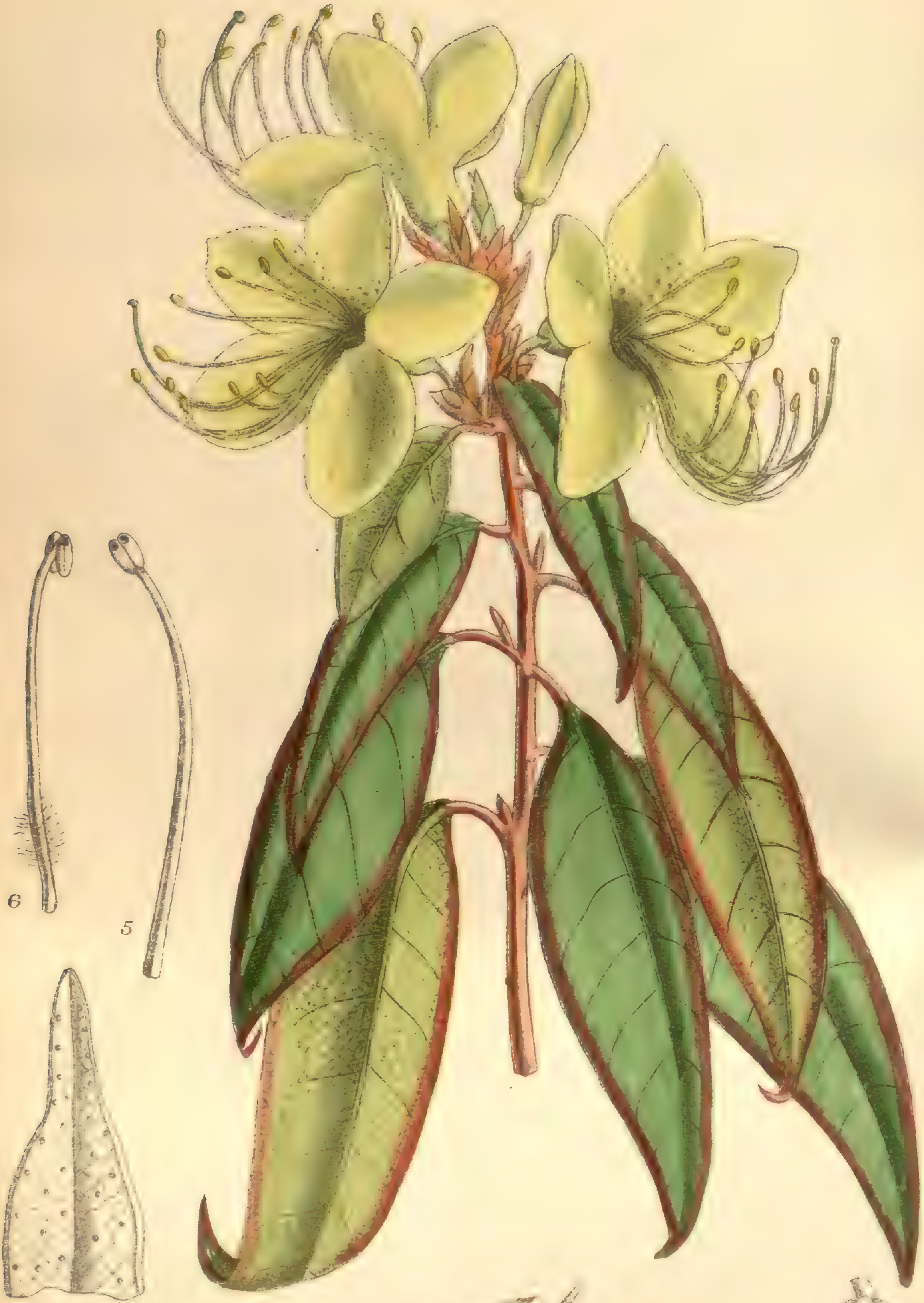
The Berberidaceous genus *Podophyllum* is the best known of several herbaceous genera of their natural family which are represented both in North America and in Eastern Asia, but are absent from Europe. It differs from the otherwise nearly related American genera *Diphylleia*, Michx, and *Jeffersonia*, Bart., in the longitudinal in place of valvular dehiscence of the anthers. The inflorescence of *Podophyllum* is best understood by comparison with that of *Diphylleia*, shown at t. 1666 of this work, where the flowers are disposed in a long-peduncled terminal cyme. In *Podophyllum pleianthum*,

Hance, a Formosan species figured at t. 7098, and in *P. versipelle*, Hance, a Chinese species depicted on t. 8154, both of which have dark red or purple flowers, the cyme is sessile and resembles an umbel, while in *P. peltatum*, Linn., the well-known May Apple of the Eastern United States, figured at t. 1819, and in its Himalayan representative *P. Emodi*, Wall., of which the former has always and the latter has normally white flowers, the inflorescence is reduced to a solitary terminal flower. In *P. Emodi*, one variety of which forms the subject of our plate, we find the only species whose flowers expand before the leaves. In this case the solitary flower at first sight conveys the impression of being subtended by an involucre of sessile laciniate bracts. This apparent involucre is really composed of the blades of the two or three cauline leaves which closely surround the apex of the peduncle by their cordate bases. At this stage the stalks of the leaves are appressed to the peduncle of the flower while their blades are deflexed and not yet fully expanded. Between flowering and fruiting the petioles diverge from the peduncle and their blades expand to their full dimensions. The material for our plate we owe to Mrs. Woodward, in whose garden at Arley Castle, Bewdley, it was raised from Chinese seed received from Mr. R. Farrer, and flowered for the first time in May, 1919. There appears to have been an earlier introduction of *P. Emodi*, var. *chinense*, for in 1914 a plant was presented to Kew by Mr. H. J. Elwes, Colesborne, Cheltenham, with a note describing it as a "seedling raised from a Podophyllum of Chinese origin with crimson flowers, sent me by Leichtlin, without name, some years ago." This variety is a native of Kansu and Szechuan, where it occurs at altitudes of 8,000–10,000 feet, and may be distinguished from typical *P. Emodi* by its much-divided leaves and constantly rose-coloured flowers. The true *P. Emodi*, which occurs in the Himalaya at altitudes of 6,000–10,000 feet, seems at first sight very different from the plant figured, for it has tripartite leaves with broad undivided segments, or with the lateral segments somewhat bilobed. But *P. Emodi* proper, and its variety *chinense*, are connected by the variety *Royleanum*, Wall.

(*P. hexandrum*, Royle) which has leaves intermediate in character. The flowers of true *P. Emodi* and of its variety *Royleanum* are usually white, but may occasionally be pink.

Description.—*Herb*, perennial; rootstock stout, horizontal, sending up annual leaves and erect annual flowering stems; roots many, adventitious, fleshy, reaching 8 in. in length. *Stems* fleshy, 10–12 in. high, about $\frac{1}{3}$ in. thick, clothed at the base with numerous cataphyllary sheaths, 2–3-foliate above with the internodes at time of flowering $\frac{1}{5}$–$\frac{2}{3}$ in. long, bearing a solitary terminal flower. *Leaves* of the stem long-stalked, cordate, 3-partite or pedately 5-partite almost to the base; lobes 3-fid halfway down; lobules acuminate; at flowering-time the erect stalks adpressed to the petiole, and with the partially expanded deflexed brown-blotched blades surrounding the apex of the peduncle like a false involucre; nerves and veins sunk above and raised beneath; lower surface of leaves white-villous; when in fruit the leaf-blades expanded, about 10 in. across. *Sepals* fugacious. *Petals* 6, ascending, obovate, rose-coloured, with undulate margin, the 3 outer $1\frac{2}{3}$ in. long, 1–$1\frac{1}{3}$ in. wide, the 3 inner similar but rather smaller. *Stamens* 6; filaments incurved, about $\frac{1}{3}$ in. long; anthers narrow-oblong, blunt, barely $\frac{1}{3}$ in. long, dehiscing longitudinally; connective wide. *Ovary* obliquely ovoid, over $\frac{1}{3}$ in. long, ventral suture strongly grooved; style short; stigma many-lobed, with the lobes suborbicular and irregularly imbricate. *Ovules* very many, attached to a much intruded fleshy placenta. *Fruit*, an ovoid red berry, about 2 in. long.

Tab. 8850.—Figs. 1 and 2, stamens; 3, pistil, showing the strong ventral groove; 4, fruit, not yet fully ripe:—*all enlarged except* 4, *which is of natural size.*



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Tab. 8851.

RHODODENDRON lutescens.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron lutescens, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. p. 235 (1886), *et in Nouv. Arch. Mus. Nat. Par.* 2me sér. vol. x. p. 52 (1887); *Rehd. et Wils. in Sargent, Pl. Wils.* i. 516 (1913); *Millais, Rhod.* p. 205 (1917); species foliis lepidotis longe acuminatis floribus flavis staminibus aliis basin versus villosis aliis glabris distinctissima.

Frutex usque ad 2 m. altus, subfastigiatus, ramis et ramulis ascendentibus brunneo-purpurascentibus, hornotinis laxe nigro-lepidotis. *Folia* laxa, late lanceolata vel fere ovato-lanceolata, acute et sensim acuminata, basi obtuse cuneata, 5–7 cm. longa, 1·5–2·5 cm. lata, viridia, marginibus plerumque rubescentibus, supra nitida, parce lepidota, infra pallide viridia, sublaxe lepidota, squamis aureis inaequalibus interdum deciduis; costa supra impressa, infra prominens, vix lepidota; nervi laterales utrinsecus circiter 6, inconspicui, flexuosi; petioli usque ad 1 cm. longi, brunnei, parce lepidoti. *Flores* axillares, plerumque solitarii, ramulorum apices versus conferti; perularum squamae brunneae, submembranaceae, dorso lepidotae, acute et abrupte acuminatae, marginibus intusque minute puberulae; pedicelli 1 cm. longi, lepidoti. *Calyx* brevissimus, undulate lobatus, circiter 1 mm. longus, extra dense lepidotus. *Corolla* indistincte 2-labiata, flava vel viridi-flava, dorso in tubo maculis pallido-viridibus punctata; tubus apertus circiter 1·3 cm. longus, extra parce lepidotus, intus breviter pubescens; lobi 5, inaequales, ovati, usque ad 2 cm. longi, extra parce lepidoti. *Stamina* 10, declinata, longe exserta, valde inaequalia, filamentis 4 superioribus brevioribus supra basin dense villosis, 6 inferioribus multo longioribus glabris; antherae aurantiaceae, 2–5 mm. longae. *Ovarium* 5-loculare, dense lepidotum; stylus curvatus, staminibus paullo longior pallide viridis, glaber, stigmate lobulato viscido coronatus. *Fructus* fere 1·5 cm. longus, lepidotus.—*R. costulatum*, Franch. in Journ. de Bot. vol. ix. p. 309 (1895).—J. Hutchinson.

The Rhododendron now figured was first discovered by the Abbé David about the year 1870 in woods near Moupine in Szechuan and was described by the late Mr. Franchet in 1886 as *R. lutescens*. It has been met with again in the same province by Mr. E. H. Wilson on various occasions when collecting on behalf of Messrs. J. Veitch and Sons and for the Arnold Arboretum. His notes speak of it as very common in thickets and in the

margins of woods fully exposed to the sun. In such situations it is one of the earliest species to open its flowers; it varies considerably, Wilson reports, in the size and texture of its leaves and the number of the flowers and stamens. The species was first raised by Messrs. Veitch in their Coombe Wood nursery from seeds sent by Wilson from Szechuan in 1904. It was raised again from seeds, also collected by Wilson, sent to Kew early in 1909 from the Arnold Arboretum, and the material for the figure now given has been obtained from one of the plants of this second introduction. One of the most distinct of the Chinese lepidote-leaved Rhododendrons, *R. lutescens* is readily recognised by the long-acuminate lanceolate leaves, the axillary yellow flowers and especially by the stamens, some of which are quite glabrous towards the base, while others in the same flower are densely villous. Notwithstanding its variability in the wild state, *R. lutescens* in cultivation has proved one of the most constant in its characters and most distinctive in its habit. Save for risk from late frosts *R. lutescens* is hardy at Kew, where it grows freely in peaty soil or in sandy loam.

Description.—*Shrub*, 6–8 ft. high, somewhat fastigiate in habit, with the purplish-brown branches and twigs which are sparingly black-lepidote in their first season, all ascending. *Leaves* lax, wide lanceolate or almost ovate-lanceolate. acutely gradually acuminate, base bluntly cuneate, 2–3 in. long, $\frac{2}{3}$–1 in. wide, green, usually with reddish margins, polished above and sparsely lepidote, paler beneath and rather laxly lepidote with the golden yellow unequal scales sometimes deciduous; midrib sunk above, raised beneath, hardly lepidote; lateral nerves about six on each side the midrib, inconspicuous, flexuous; petiole about $\frac{1}{3}$ in. long, brown, sparsely lepidote. *Flowers* axillary, usually solitary, clustered towards the tips of the flowering-shoots; bud-scales brown, almost membranous, lepidote outside, acutely and abruptly acuminate, finely puberulous on the margin and within; pedicels about $\frac{1}{3}$ in. long, lepidote. *Calyx* very short, undulately lobed, densely lepidote outside. *Corolla* indistinctly 2-lipped, yellow or greenish-yellow, punctate with pale green spots within the tube behind; tube open, over $\frac{1}{2}$ in. long, sparingly lepidote outside, stoutly pubescent within; lobes 5, unequal, ovate, up to $\frac{3}{4}$ in. long, sparingly lepidote outside. *Stamens* 10, declinate, far exserted, very unequal, the 4 upper filaments shorter than the rest and densely villous just above the base, the 6 lower much longer and glabrous; anthers golden-yellow, $\frac{1}{10}$ in. long. *Ovary* 5-celled, densely lepidote; style curved, pale green, glabrous, slightly larger than the lower stamens, crowned by the lobulate viscid stigma.

Tab. 8851.—Fig. 1, apex of a leaf; 2, portion of leaf showing margin; 3, a flower, the corolla removed; 4, calyx and ovary; 5, lower stamen; 6, upper stamen;—*all enlarged.*

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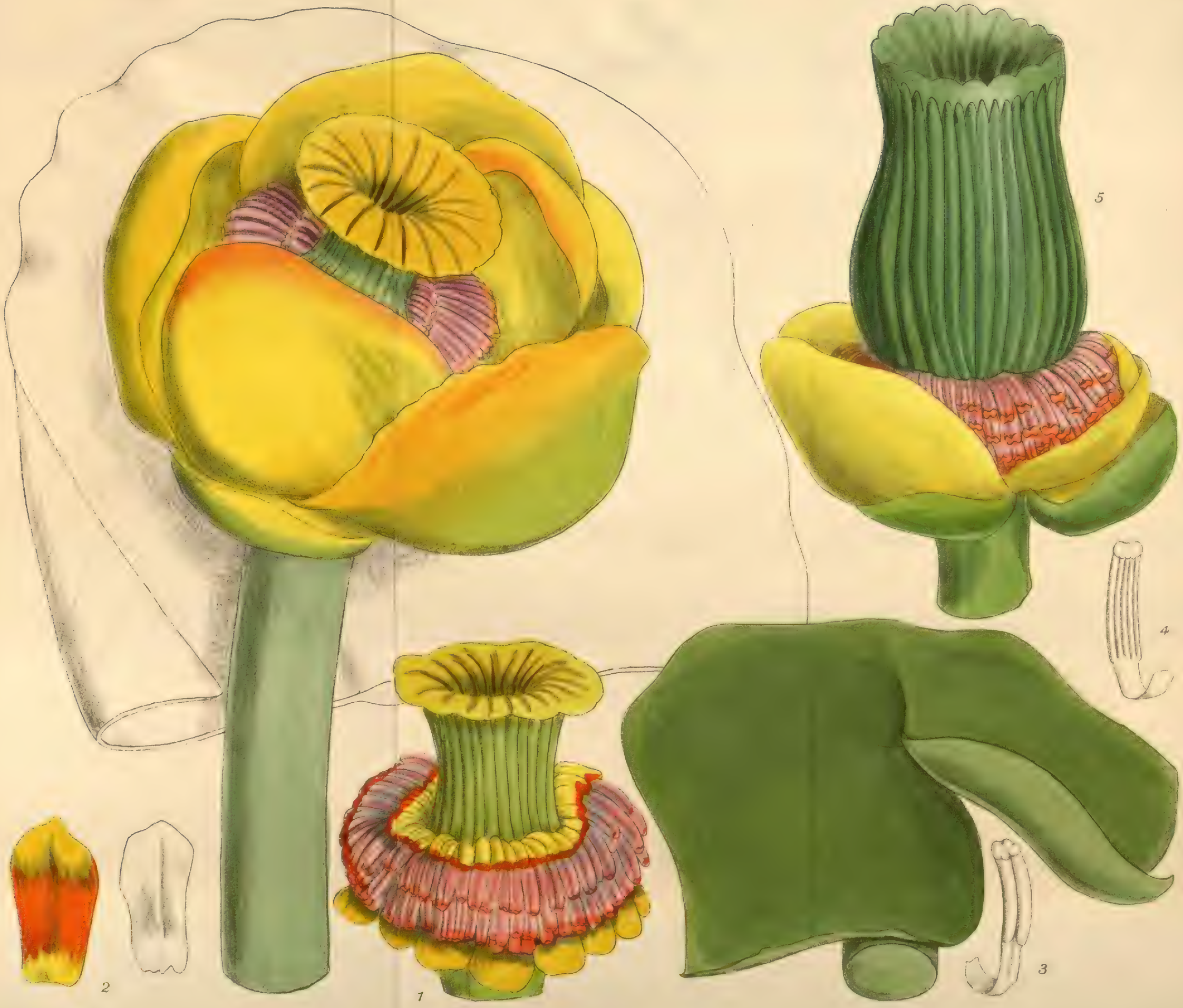

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Tab. 8852.

NUPHAR POLYSEPALUM.

Western North America.

Nymphaeaceae. Suborder Nymphaeae.

Nuphar, *Sm.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 46.

Nuphar polysepalum, *Engelm. in Trans. Acad. Sc. St. Louis*, vol. ii. p. 282 (1865); *B. L. Robinson in A. Gray, Syn. Fl. N. Am.* vol. i. part 1, p. 77; species a congeneribus floribus magnis, sepalis 9 distincta.

Herba perennis, aquatica, rhizomate crasso repente. *Folia* saepius natantia, longe petiolata, ovato-reniformia, 2–4 dm. longa, 1·5–2·5 dm. lata, apice rotundata, integra, glabra, sinu basali saepius aperto, 8–11 cm. profundo; nervi laterales numerosi, paralleli, patuli, basi flabellato-radiantes, versus marginem semel vel bis bifurcati. *Flores* solitarii, longe pedunculati, depresso-globosi, 8 cm. diametro, circiter 6 cm. alti. *Sepala* 9; 3 exteriora valde concava, basi deflexa, circiter 1·7 cm. supra basin ascendentia, ovata, apice rotundata, 2·7 cm. longa, 3·5 cm. lata, extra intense viridia, intus viridi-lutea; sepala interiora late obovata, 4–6 cm. longa et lata, plus minusve late unguiculata, intus intense lutea; 3 intermedia extra medio viridia, margine lutea; 3 interiora intense lutea, rubescentia. *Petala* numerosa, oblonga, 1·5–2 cm. longa, 7–13 mm. lata, crassa, lutea, zona transversa rubra. *Stamina* perplurima, circiter 6-seriata, 2·3–2·4 cm. longa, reflexa; antherae introrsae, rubrae, demum intus purpureae, filamenta lutea aequantes vel iis sub-breviores; connectivum crassum, truncatum. *Pistillum* 3·2 cm. longum; discus stigmatifer crateriformis, 3·5 cm. diametro, circiter 1·2 cm. profundus; radii 19–21. *Bacca* oblongo-ampullacea, 6–7 cm. longa, disco stigmatifero 2 cm. profundo. *Semina* plurima, anguste obovoidea, 5 mm. longa, brunnea, nitentia.—*Nymphaea polysepala*, Greene in Bull. Torr. Bot. Club, 1888, vol. xv. p. 84; Miller et Standley in Contrib. U.S. Nat. Herb. vol. xvi. p. 103.—T. A. Sprague.

Linnaeus in 1753 placed both the white water-lily, figured at t. 819 of this work, and the yellow one figured at t. 1243, in the genus *Nymphaea* as *N. alba* and *N. lutea* respectively. Salisbury in 1805 separated the white from the yellow water lilies, using for the former the generic name *Castalia*, and for the latter alone the name *Nymphaea*. Sibthorp and Smith in 1808 arrived at the same conclusion as Salisbury, but retained the name *Nymphaea* for the white and used the name *Nuphar* for the yellow. Greene in 1887 pointed out for the first time that the names used by Salisbury have priority. But while some botanists have adopted the names of Salisbury, others, and notably Conard, the distinguished

monographer of the water-lilies, have continued to employ those rendered familar by Smith. We therefore follow Conard's usage. The species of *Nuphar* now figured as *N. polysepalum* is the first of its genus from a garden standpoint; its flowers are larger than in any other, and there are nine petaloid sepals as against six in the other species. The anthers develop a rich plum colour, and become reflexed, adding to the beauty of the flower. For the material of *N. polysepalum*, which is a native of mountain lakes in Colorado, we are indebted to Sir F. W. Moore. This material was supplied in 1919 from a plant purchased on the Continent some fourteen years before under another name. It has proved of slow growth and hard to establish, the original plant now having but two good crowns, though it is a vigorous example. It has to be grown in about two feet of water with several inches of rich mud. In spring it moves even earlier than the common *N. luteum*; the young leaves appear above the water in March; the flower-buds form in April. The leaves, at first dark bronze green with a red flush, stand upright and well above the water for a considerable period before they eventually bend down to the surface of the pond, while those leaves that appear later in the season remain upright even longer than those first formed.

DESCRIPTION.—*Herb*, aquatic, perennial; rootstock creeping, stout. *Leaves* mostly floating, long-stalked, ovate-reniform, 8–16 in. long, 6–10 in. wide, rounded at the tip, margin entire, basal sinus usually open, $3\frac{1}{4}$–$4\frac{1}{2}$ in. deep, glabrous on both surfaces; lateral nerves many, parallel, spreading, the basal diverging flabellately, all forking once or twice towards the margin. *Flowers* solitary, long-stalked, depressed-globose, over 3 in. across, about $2\frac{1}{2}$ in. high. *Sepals* 9; outermost 3 very concave, deflexed at the base for about $\frac{2}{3}$ in., then ascending, ovate with rounded apex, over 1 in. long, about $1\frac{1}{2}$ in. wide, deep green outside, yellowish-green within; the remainder wide obovate, $1\frac{2}{3}$–$2\frac{1}{2}$ in. long and as much across, more or less broadly clawed, all deep yellow within, the intermediate 3 green in the middle with a yellow margin outside, the innermost 3 deep yellow with a reddish tinge outside. *Petals* many, oblong, $\frac{2}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. wide, stout, yellow, with a transverse red band. *Stamens* very many, about 6-seriate, under 1 in. long, reflexed; anthers introrse, red and at length purple on the inner face; filaments yellow, as long as or rather shorter than the anthers; connective stout, truncate. *Pistil* $1\frac{1}{3}$ in. long; stigmatic disk cup-shaped, nearly $1\frac{1}{2}$ in. wide, about $\frac{1}{2}$ in. deep; stigmatic rays 19–21. *Fruit* an oblong flasklike berry $2\frac{1}{2}$–3 in. long, crowned by the stigmatic disk now $\frac{3}{4}$ in. deep. *Seeds* many, narrow obovoid, $\frac{1}{5}$ in. long, brown, shining.

TAB. 8852.—Fig. 1, pistil and stamens; 2, petals; 3, stamen, seen from in front; 4, the same, seen from behind; 5, fruit:—*all enlarged except* 1 *and* 5, ***which are of natural size.***

M.S. del, A.W.D. lith.

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Tab. 8853.

PLEUROTHALLIS grandis.

Costa Rica.

Orchidaceae. Tribe Epidendreae.

Pleurothallis, *R. Br.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 488.

Pleurothallis (§ Macrophyllae Racemosae) **grandis**, *Rolfe in Kew Bulletin*, 1918, p. 234; affinis *P. lamellari*, Lindl., sed scapis longioribus erectis et floribus duplo majoribus facile distinguenda.

Herba epiphytica, circiter 50 cm. alta. *Caules* elongati, cylindrici, 30–40 cm. longi, vaginis paucis tubulosis carinatis 7–9 cm. longis obtecti. *Folia* sessilia, subcordato-ovata, subobtusa, coriacea, 17–22 cm. longa, 9–17 cm. lata. *Spatha* lanceolato-oblonga, acuta, conduplicata, 3 cm. longa. *Scapi* erecti, 45 cm. longi; racemi multiflori; bracteae ovatae, subacutae vel apiculatae, conduplicato-concavae, circiter 1 cm. longae; pedicelli arcuati, verruculosi, 1·5 cm. longi. *Flores* secundi, patentes, pro genere magni, brunneo-suffusi. *Sepalum* posticum suberectum, lineari-lanceolatum, subobtusum, 2·8 cm. longum, basi subconcavum, margine revolutum; *sepala* lateralia alte connata, oblonga, subconcava, 3 cm. longa, 1·2 cm. lata, apice biloba, lobis subobtusis. *Petala* parallela, oblonga, obtusa, coriacea, 1 cm. longa, supra medium valde incurva. *Labellum* ovato-oblongum, obtusum, 2 cm. longum, basi dilatatum, ad latera involutum et verruculosum, apice abrupte incurvum; discus carnosus. *Columna* clavata, 5 mm. longa.—**R. A. Rolfe.**

The large and very distinct *Pleurothallis* here figured is a native of Costa Rica, where it was discovered near Cachi by Mr. C. H. Lankester. A living plant was sent to Kew, together with several other interesting Orchids, and first flowered in the collection in September, 1917, when the annexed drawing was made. It belongs to Lindley's group *Macrophyllae Racemosae*, and is most comparable to the Bolivian *P. lamellaris*, Lindl., though the flowers are over twice as large. It is one of the comparatively few species of a large and very polymorphic Tropical American genus, now numbering at least 500 species, which possesses horticultural merit. About a dozen of them have been figured in this work at various times, but none of these are very nearly allied to the present one. The treatment called for in

the case of *P. grandis* differs from that suitable for most other species of the genus. It requires warmer conditions and must be cultivated in an intermediate house. It thrives well at Kew in fibrous peat and sphagnum moss. It needs good drainage and the roots must be kept constantly moist.

DESCRIPTION.—*Herb*, epiphytic, over 1½ ft. high; stems elongated, cylindric, 1–1¼ ft. long, sparingly clothed with tubular keeled sheaths 3–3¾ in. long. *Leaves* sessile, subcordate ovate, somewhat obtuse, coriaceous, 7–9 in. long, 3¾–7 in. wide. *Spathe* lanceolate-oblong, acute, conduplicate, 1¼ in. long; scapes erect 1½ ft. long; racemes many-flowered; bracts ovate, subacute or apiculate, conduplicate-concave, over ⅓ in. long; pedicels curved, finely warted, nearly ⅔ in. long. *Flowers* secund, spreading, unusually large for their genus, tinged with brown. *Scpals:* posterior suberect, linear-lanceolate, subobtuse, over 1 in. long, somewhat concave at the base, the margin revolute; lateral connate about halfway up, oblong, rather concave, 1¼ in. long, ½ in. wide, 2-lobed at the tip, the lobes subobtuse. *Petals* parallel, oblong, blunt, coriaceous, over ⅓ in. long, much incurved above the middle. *Lip* ovate-oblong, blunt, ¾ in. long, dilated at the base, involute and finely warted at the sides, abruptly incurved at the tip; disk fleshy. *Column* clavate, ⅕ in. long.

TAB. 8853.—Fig. 1, flower with the sepals removed; 2 lip; 3, column; 4, anther-case; 5, pollinia; 6, sketch of an entire plant:—*all enlarged except* 6, ***which is much reduced.***

M.S. del, A.W.D. lith.

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Tab. 8854.

COTONEASTER serotina.

Western China.

Rosaceae. Tribe Pomeae.

Cotoneaster, *Medik ex Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 627.

Cotoneaster serotina, *Hutchinson*; species nova affinis *C. turbinatae*, Craib, et *C. glaucophyllae*, Franch., ab illa foliis ellipticis infra mox glabrescentibus stipulis deciduis, fructibus globosis glabris, ab hac foliis infra haud glaucis breviter acuminatis, receptaculis subanthesin dense villosis, calycis lobis subulato-triangularibus differt.

Arbor parva; ramuli hornotini sericeo-pubescentes, annotini glabri et nitidi, cortice brunneo longitudinaliter rupto obtecti. *Folia* elliptica vel obovato-elliptica, apice acute et abrupte apiculata, basi breviter cuneata, 4–7 cm. longa, 2·5–4 cm. lata, chartacea, utrinque tenuiter reticulata, supra fere glabra, infra molliter pubescentia sed mox glabrescentia; nervi laterales utrinsecus circiter 8, a costa media sub angulo 45° abeuntes, infra prominentes; petioli circiter 1 cm. longi, supra dense hirsuti, infra glabrescentes; stipulae lineari-subulatae, 5 mm. longae, fere glabrae, mox deciduae. *Inflorescentia* multiflora, late corymbiformis, villosa; pedicelli ultimi usque ad 3 mm. longi, bracteae setosae, 2·5 mm. longae, mox deciduae. *Receptaculum* turbinatum, dense villosum. Sepala subulato-deltoidea, pilosa. *Petala* albida, rotundata, crenulata. *Antherae* rubro-brunneae. *Carpella* 2, demum glabra. *Fructus* globosus, ruber, circiter 7 mm. diametro, glaber.—*C. glaucophylla*, Hort. ex Gard. Chron. vol. lxv. p. 34 (1919); non Franch.—J. Hutchinson.

The *Cotoneaster* here figured was raised in the garden of Mr. G. H. Cave, Rodway Hill House, Mangotsfield; it was collected by Mr. G. Forrest in Western China and distributed under his number 6754. A plant given by Mr. Cave to Mr. G. H. Wollaston, Flaxley Cottage, Flax Bourton, flowered in the garden of the latter in 1918 and yielded the fruiting spray shown in our plate, which was sent to Kew in January, 1919. The flowering spray figured came from one of Mr. Cave's plants in July, 1919. Mr. Wollaston was of opinion that this plant might be a form of *C. turbinata*, Craib, figured at t. 8546 of this work, only differing from the type in having smooth in place of hairy fruits. On the other hand, a spray from one of Mr. Cave's plants was certificated at an exhibition

of the Royal Horticultural Society as *C. glaucophylla*, Franch. That *C. serotina* is closely related to both of the species with which it has been associated is no doubt true. But when all these are closely examined they are seen to be quite distinct, *C. serotina* being readily separable from *C. turbinata* by its smooth berries and from *C. glaucophylla* by its green leaves. Various other differences, as Mr. Hutchinson points out, accompany these salient ones. The name used for this species is employed because *C. serotina* agrees with *C. turbinata* in flowering as late as August when flowering garden-shrubs are somewhat scarce. The bright red attractive fruits persist during the greater part of the winter. *C. serotina* appears to share with most of its congeners the features of hardiness and ease of cultivation; they thrive in any soil which is not waterlogged, succeeding well even in the poor sandy soil at Kew, but growing still more vigorously in a good loam. To secure the best crops of flowers and fruit a sunny position should be selected.

Description.—*Tree* of small size; shoots of the first year silky pubescent, becoming glabrous and polished by the second season; bark brown, cracking longitudinally. *Leaves* elliptic or obovate elliptic, tip acute and abruptly apiculate, base shortly cuneate, $1\frac{2}{3}$–3 in. long, 1–$1\frac{2}{3}$ in. wide, papery, finely reticulated on both surfaces, above nearly glabrous, beneath at first softly pubescent but soon becoming glabrescent, lateral nerves about 8 on each side the midrib which they leave at an angle of 45°, raised underneath; petiole over $\frac{1}{3}$ in. long, densely hairy above, glabrescent beneath; stipules linear-subulate, $\frac{1}{5}$ in. long, nearly glabrous, soon falling. *Inflorescence* many-flowered, wide-corymbiform, villous; ultimate pedicels up to $\frac{1}{8}$ in. long; bracts setose, $\frac{1}{10}$ in. long, soon falling. *Receptacle* turbinate, densely hairy. *Sepals* subulate-deltoid, pilose. *Petals* white, rounded, crenulate. *Anthers* reddish-brown. *Carpels* 2, ultimately glabrous. *Fruit* globose, red, under $\frac{1}{3}$ in. across, glabrous.

Tab. 8854.—Fig. 1, flower-bud; 2, flower in vertical section, the petals and stamens removed; 3, flower, laid open, the pistil removed; 4 and 5, stamens:—*all enlarged.*

M S del. A.W.D lith

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Tab. 8855.

DAPHNE tangutica.

Kansu.

Thymelaeaceae. Tribe Euthymelaeeae.

Daphne, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 190.

Daphne tangutica, *Maxim. in Bull. Acad. Sci. St. Petersb.* vol. xxvii. p. 531 (1883); *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 396 (1891); *Rehd. in Plant. Wils.* vol. ii. pp. 543, 545; species ad *D. retusam*, Hemsl., arcte accedens sed foliis longioribus pro rata angustioribus, perulis minus ciliatis, stigmate glabrescente apte distinguenda.

Frutex vix sesquimetralis, dense ramosus, robustus, conglobatus; novelli cinereo-brunnei, crassi, primum setis cinereis induti, demum fere glabri. *Folia* persistentia, coriacea, oblanceolata vel anguste elliptica, apice saepius emarginata, basi in petiolum brevem robustum angustata, margine parum revoluta, utrinque glabra, supra intense viridia, nitida, subtus pallidiora, hebetia, 2·5–7·5 cm. longa, 0·6–1·8 cm. lata. *Flores* in umbellam terminalem 3·8 cm. latam aggregati, singuli ex axillis perularum oblongarum acutarum margine ciliatarum ceterum glabrarum orti, vere fere peracto aperti. *Perianthum* 4-lobum, basi tubulosum, extra roseo-purpureum, glabrum; tubus 1·5 cm. longus; limbus 1·2 cm. latus; lobi ovati, obtusi, intus 2 albi, 2 basi albi apicem versus purpureo tincti. *Stamina* 8, 2-seriata; series 4-antherae superpositae; antherae luteae filamentis triplo longiores. *Pistillum* 3 mm. longum, ovario ovoideo glabro, stylo crasso perbrevi, stigmate capitato fere glabro. *Bacca* rubra, carnosa, ovoideo-globosa, 1 cm. longa, 0·8 cm. lata.—W. J. Bean.

Daphne tangutica was originally discovered by the famous Russian traveller, Przewalski, in Kansu, Western China, in 1873, but was not described and named by Maximowicz until ten years later. Although quite distinct in its general aspect from *D. retusa*, Hemsl., figured at t. 8430 of this work, it is undoubtedly very closely allied to that species. In *D. retusa*, however, the leaves are shorter and proportionately broader, the perulae are more markedly ciliate, and the stigma is distinctly pubescent. Mr. Rehder, in "Plantae Wilsonianae," relies on the "ramuli glabri" of *D. tangutica* to separate it from *D. retusa*, but the young shoots of both are at first covered with small strigose hairs. Judging from the rather scanty material as yet available, the

umbels of *D. tangutica* are smaller than those of *D. retusa*, the flowers are more densely packed, and the perianth is more highly coloured. The material from which our plate was prepared was kindly furnished by Mrs. Woodward of Arley Castle, near Bewdley, with whom it flowered in April, 1919. It was introduced to this country in 1914 from Kansu by Mr. Reginald Farrer under his number 271, and is described in his notes as a dense, low bush about a foot high and through, found dotted in open turf on slopes 9,000–10,000 feet above sea-level, in deep calcareous loam or vegetable mould. To Kew Mrs. Woodward presented two small plants which up to the present are thriving well in sandy loam. But Daphnes are notoriously difficult shrubs to keep permanently in good health, and it is too soon yet to say with certainty how *D. tangutica* will adapt itself to the climate of the Thames valley. There would appear to be little to fear in regard to its perfect hardiness at Bewdley where the original seed was sown in October, 1914, and germinated in March, 1915. The plant raised stood the frost of 1916–17 perfectly out of doors, and flowered for the first time in March, 1918. In 1920, Mrs. Woodward informs us, one plant barely eighteen inches high bore fifty heads of blossom about an inch and a half across, while another only a foot high had ten bunches of flowers.

DESCRIPTION.—*Shrub*, probably not exceeding 3–4 ft. high, densely branched and of sturdy rounded form; young shoots stout, greyish-brown, at first clothed with pale grey bristles, at length becoming nearly glabrous. *Leaves* persistent, leathery, oblanceolate or narrowly elliptic, usually emarginate at the apex, narrowed at the base to a short stout petiole, margin slightly revolute, glabrous on both surfaces, dark rather glossy green above, paler and dull beneath, 1–3 in. long, $\frac{1}{4}$–$\frac{3}{4}$ in. wide. *Flowers* in terminal umbels 1$\frac{1}{2}$ in. in diameter, opening in April or May from the axils of oblong, pointed, ciliate but otherwise glabrous bud-scales. *Perianth* glabrous, 4-lobed, with a tubular base, rosy-purple outside; tube $\frac{5}{8}$ in. long; limb $\frac{1}{2}$ in. wide; lobes ovate obtuse, white inside, two of them stained with purple towards the tips. *Stamens* 8, in two superposed series of 4 each; anthers yellow, about thrice as long as the filaments. *Pistil* $\frac{1}{8}$ in. long; ovary glabrous, ovoid; style very short and thick; stigma capitate, glabrous or nearly so. *Berry* red, fleshy, ovoid-globose, $\frac{2}{5}$ in. long, $\frac{1}{3}$ in. wide.

TAB. 8855.—Fig. 1, flowers laid open, showing stamens and pistil; 2, pistil:—*both enlarged.*

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Tab. 8856.

COELOGYNE integerrima.

Philippines.

Orchidaceae. Tribe Epidendreae.

Coelogyne, *Lindl.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518.

Coelogyne integerrima, *Ames in Philipp. Journ. Sci.* vol. iv. p. 665 (1910); species *C. cinnamomeae*, Teijsm. et Binn., affinis sed segmentis latioribus, labello subpandurato integro et brunneo-striato differt.

Herba epiphytica; pseudobulbi aggregati, ovoideo-oblongi, 5–8 cm. longi, diphylli. *Folia* elliptico-lanceolata, acuta vel breviter acuminata, prominenter 3–5-nervia, basi in petiolum attenuata, 15–18 cm. longa, 3·5–6 cm. lata; petiolus 2–3 cm. longus. *Scapi* arcuati, 20–30 cm. longi, basi vaginis spathaceis imbricatis obtecti; racemi laxi, multiflori; bracteae oblongae, subacutae, concavae, 2·2–2·5 cm. longae; pedicelli 1–1·3 cm. longi. *Sepalum* posticum ovato-ellipticum, obtusum, 2·5 cm. longum, 1 cm. latum; *sepala* lateralia oblonga, obtusa, carinata, postico paullo angustiora. *Petala* linearia, acuta, trinervia, 2–2·5 cm. longa, 5 mm. lata. *Labellum* subpanduratum, obtusum, integrum, 2–2·3 cm. longum, 1–1·2 cm. latum, basi angustius; discus ad apicem tricarinatus, carinis integris. *Columna* clavata, 1 cm longa; pollinia 4, obovata, apice appendice granulosa connexa.—R. A. Rolfe.

This very distinct *Coelogyne* is a native of the Philippines, and was originally described in 1910, the locality being given as Mount Pulog, in the Province of Benguet, in the lower mossy forest, at about 7,000 feet above sea-level, where it was collected by Mr. E. D. Merrill in 1900. It had previously been collected by Mr. A. Loher in the same province, as is shown by specimens preserved at Kew. Some three years after it was described it appeared in cultivation, having been exhibited by Messrs. Sander and Sons at the Chelsea Show of the Royal Horticultural Society in May, 1913. It is allied to the rare Javan *C. cinnamomea*, Teijsm. et Binn., but has a pandurate lip, somewhat narrowed behind, instead of being broadly ovate, and the area between the entire keels is dark red-brown, with a band of the same colour on the side lobes. The rest of the flower is light green. The plant here figured was received from Messrs. Sander,

St. Albans, in 1913, and our drawing was made when it flowered at Kew in June, 1916. Under cultivation, *C. integerrima* thrives well in a tropical house in a compost of fibrous peat and sphagnum. During its season of growth it requires a liberal supply of water, but when the growth has become fully matured all that is necessary is to supply moisture just sufficient to prevent the pseudobulbs from shrivelling.

Description.—*Herb*, epiphytic; pseudobulbs clustered, ovoid-oblong, 2–3¼ in. long, 2-foliate. *Leaves* elliptic-lanceolate, acute or shortly acuminate, prominently 3–5-nerved, narrowed below to a distinct petiole, 6–7 in. long, 1⅓–2¼ in. wide; petiole ¾–1¼ in. long. *Scapes* curved, 8–12 in. long, clothed at the base with spathaceous imbricate sheaths; racemes lax, many-flowered; bracts oblong, subacute, concave, about 1 in. long; pedicels ⅓–½ in. long. *Sepals*: posterior ovate-elliptic, blunt, 1 in. long, over ⅓ in. wide; lateral oblong, blunt, keeled, rather narrower than the posterior. *Petals* linear, acute, 3-nerved, ¾–1 in. long, ⅕ in. wide. *Lip* subpanduriform, blunt, entire, over ¾ in. long, about ½ in. wide, rather narrower at the base; disk 3-carinate at the tip, the keels entire. *Column* clavate, over ⅓ in. long; pollinia 4, obovate, connected at the tip by means of a granular appendage.

Tab. 8856.—Fig. 1, lip; 2, column; 3, anther-cap; 4, pollinia: —*all enlarged.*

M.S. del, A.W.D. lith.

L. Reeve & Cº London.

Tab. 8857.

BERBERIS atrocarpa.

Western Szechuan.

Berberidaceae. Tribe Berberideae.

Berberis, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43.

Berberis atrocarpa, *Schneider in Plant. Wils.* vol. iii. p. 437; species a *B. levi*, Franch., haud procul distans, ab ea tamen ramulis angulatis et sulcatis, foliis tenuioribus, ambitu longioribus et pro rata angustioribus, margine minus arcte serratis, facillime distinguenda.

Frutex erectus, 2-metralis; ramuli cinerei, glabri, sulcati, stricti, spinis rigidis 3-partitis, pallide brunneis, 2–4 cm. longis armati; internodi 2·5–6 cm. longi. *Folia* sempervirentia, apud nodos 3–8-phyllos fasciculata, coriacea, glabra, elliptico-lanceolata, 4–8·5 cm. longa, 0·5–1·5 cm. lata, apice acuta, basi gradatim cuneata, margine dentibus gracillimis sursum versis 1·5 mm. longis remotius obsita, supra subnitentia atroviridia, subtus pallidiora, utrinque levissima; nervi valde obscuri; petiolus 4 mm. longus nunc subobsoletus. *Flores* vernales, ad nodos in fasciculos 6–12-floros aggregati, lutei, 8–12 mm. diametientes; pedicelli graciles, teretes, glabri, 6–12 mm. longi. *Sepala* ovata. *Petala* oblonga, apice 2-fida. *Fructus* ovoideus vel ovalis, primum coeruleo-pruinosus, demum aterrimus, nitens, 9 mm. longus, stylo persistente coronatus, auctumno peracto maturus.—*B. levis*, Schneider in Plant. Wils. vol. i. p. 360; Bean, Trees & Shrubs Brit. Isles, vol. i. p. 244; non. Franch.—W. J. Bean.

The plate of the Barbery here figured was prepared from a plant raised from seed collected in Western Szechuan in November, 1908, at about 5000–6500 feet above sea-level, by Mr. E. H. Wilson. A share of this seed had been presented to Kew by Professor C. S. Sargent, Arnold Arboretum, and was received under the "Wilson" number 1284. The first of the resulting plants to flower at Kew did so in April, 1914. In his original elaboration of the barberies collected by Wilson, Mr. C. K. Schneider (Plant. Wils. vol. i. p. 360) identified the plant now figured with the species described by the late Mr. Franchet as *B. levis*. Further study, however, led Schneider to reconsider this determination, and in a later section of the same work (vol. iii. p. 437) he made Wilson's no. 1284 the type of a distinct species, *B. atrocarpa*, basing his differentiation

mainly on the "jet-black almost globose fruit" of Wilson's plant, the fruits of the original *B. levis* being ovate and blue-black. This particular feature we find, however, to be far from distinctive, for in *B. atrocarpa* the fruits before becoming jet-black are covered with a blue bloom, while, at least on our plant of *B. atrocarpa* at Kew, the fruits rarely approach a globose shape, their usual form being somewhat narrowly ovoid. Yet there is little room to doubt that Schneider is fully justified in regarding *B. atrocarpa* as specifically distinct from *B. levis*. The two species are certainly closely allied, and are both well marked among their nearest congeners by the immersed almost invisible secondary nerves of the leaves. Yet *B. atrocarpa* is easily distinguished from *B. levis* by its angular grooved branchlets, by its thinner, longer and proportionately narrower leaf-blades, the serrations along the margin of which are more remote, and especially by the smaller number of flowers in a fascicle. We have not found more than eight flowers together in *B. atrocarpa*, and the number is rarely so great, whereas according to Franchet there are in *B. levis* sometimes as many as forty. *B. atrocarpa* is one of the most vigorous of evergreen barberies and one of the most formidably armed, its slender needle-like spines having a steel-like rigidity. It grows freely, and although it suffered to some extent in the hard weather of the early part of 1917, it soon recovered.

Description.—*Shrub* of erect habit, 5–6 ft. high; branchlets stiff, grey, glabrous, sulcate, armed with very rigid, three-pronged, pale brown spines $\frac{3}{4}$–$1\frac{1}{2}$ in. long; internodes 1–$2\frac{1}{2}$ in. long. *Leaves* evergreen, in clusters of three to eight at each node, coriaceous, glabrous, elliptic-lanceolate, $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{5}{8}$ in. wide, acute, slenderly cuneate at the base, subsessile or with a petiole up to $\frac{1}{6}$ in. long; margins set with slender, forward-pointing teeth $\frac{1}{16}$ in. long; dark rather glossy green above, paler beneath, very smooth; nerves scarcely perceptible. *Flowers* produced at the nodes in April, in fascicles of 6–12, yellow, $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter; pedicels $\frac{1}{4}$ to $\frac{1}{2}$ in. long, slender, terete, glabrous. *Sepals* oval. *Petals* bifid at the apex. *Fruit* ovoid to oval, $\frac{3}{8}$ in. long, at first covered with a blue bloom, ultimately black and shining, the style adhering at the summit, ripening in October.

Tab. 8857.—Fig. 1, flower; 2, petal; 3, stamen; 4, pistil:—*all enlarged.*

Tab. 8858.

ALLIUM sikkimense.

Sikkim.

Liliaceae. Tribe Allieae.

Allium, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 802.

Allium sikkimense, *Baker in Journ. Bot.* 1874, p. 292; *Regel, Monogr. Allior.* p. 146; species *A. kansuensi*, Regel, affinis, staminibus alternis inappendiculatis differt.

Herba; bulbi caespitosi, perpendiculares, cylindrici, usque ad 5 cm. longi, tunicis exterioribus demum fibrosis. *Folia* 2–3, superposita, linearia, concava, ad 23 cm. longa, 4 mm. lata, marginibus minute scabris exceptis glabra. *Pedunculus* quam folia longior vel brevior; spatha cymbiformis, rostrata, 2 cm. longa, 1 cm. lata (explanata), membranacea, glabra; umbella pauci- vel usque ad 20-flora; pedicelli 2–4 mm. longi, inferiores saepe nutantes. *Perianthium* ovoideo-campanulatum, coeruleo-purpureum; segmenta ovata, leviter cucullata, exteriora 6 mm. longa, interiora paullo longiora. *Stamina* quam perianthii segmenta paullo breviora; filamenta exteriora simpliciter subulata, interiora utrinque quadratim dentata. *Ovarium* 3-lobum, basi 3-foraminatum; stylus subulatus, ovario aequilongus.—C. H. Wright.

Allium sikkimense belongs to the section *Rhiziridium* in which the bulb, instead of becoming globose or ovoid, remains cylindric, and often (as in the present instance) has its outer coat breaking up with age into parallel strands of tough fibres. Regel subdivides this section into those species which have a creeping "rhizome" and those in which the so-called "rhizome" is perpendicular, but inadvertently places the present species, which he had not seen, in the former group; its bulbs, except the slightly curved ones at the outside of a clump, are cylindric and erect. A native of alpine Sikkim, *A. sikkimense* was discovered in August, 1848, by Sir J. D. Hooker at Lachen between 10,000 and 11,000 feet, and at Tungu at 14,000 feet, and was again collected in 1911 by Ribu and Rhomoo at Cholamoo, at an altitude of 16,000 feet. It flowered with Mr. H. J. Elwes at Colesborne, Cheltenham, in March, 1877, and again at the same place in June, 1919; in the latter case

from material supplied by Mr. G. H. Cave. It is also established in the Rock Garden at Kew, where the plant here figured was raised from seed received in 1917 from the Royal Botanic Garden, Calcutta. At Kew it is quite hardy and ripens its seeds. Besides *A. sikkimense*, two other species of *Allium* with blue flowers have been in cultivation. One of these, *A. kansuense*, Regel (*A. cyaneum*, var. *brachystemon*, Regel) has been figured at plate 7,290 of this work and is a native of the Chinese province of Kansu, where it has been found during recent years at elevations of 9,000 to 10,000 feet by Mr. E. H. Wilson and Mr. R. Farrer; it has also been successfully grown by Mr. H. J. Elwes. It much resembles *A. sikkimense*, from which it differs in having all the filaments toothed at the base, a character which, although inconspicuous, may be of some significance in connection with pollination. The other species is *A. cyaneum*, Regel (Gartenflora, t. 1317, fig. 2), also from Kansu, which is readily distinguished by its filiform semiterete leaves and by its stamens being twice as long as the perianth and having only their alternate filaments toothed at the base.

Description.—*Herb*, bulbs tufted, vertical, cylindric, sometimes as much as 2 in. long, the outer sheaths with age fibrous. *Leaves* 2–3, superposed, linear concave, up to 9–10 in. long, $\frac{1}{6}$ in. wide, glabrous except on the margin which is finely scabrid. *Peduncle* longer or barely as long as the leaves; spathe cymbiform, beaked, $\frac{3}{4}$ in. long, over $\frac{1}{3}$ in. wide when flattened out, membranous, glabrous; umbel few-flowered to as much as 20-flowered; pedicels $\frac{1}{12}$–$\frac{1}{6}$ in. long, the outer ones often nodding. *Perianth* ovoid-campanulate, blue-purple; segments ovate, slightly hooded, the outer ones $\frac{1}{4}$ in. long, the inner rather longer. *Stamens* rather shorter than the perianth-segments; outer filaments simple, subulate; inner quadrately expanded and toothed on both sides in the lower third. *Ovary* 3-lobed, with 3 basal foramina; style subulate, as long as the ovary.

Tab. 8858.—Fig. 1, portion of a leaf; 2, a flower; 3, half of the perianth, laid open, showing the staminal insertion; 4 and 5, stamens; 6, pistil:—*all enlarged.*

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M.S. del, A.W.D. lith.

L. Reeve & Cº London.

Tab. 8859.

SABIA latifolia.

China.

Sabiaceae. Tribe Sabieae.

Sabia, *Colebr.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 414.

Sabia latifolia, *Rehd. et Wils. in Sargent, Plant. Wils.* pars iv. p. 195; species cum *S. japonica*, Maxim., comparanda sed inflorescentiis cymosis et indumento dissimili apte distinguenda.

Frutex 2–3-metralis; novelli pubescentes cito glabrati, deinde cortice viridi vel lutescente vel purpurascente longius persistente obtecti. *Gemmae* ovoideae ad 1·5 mm. longae; perulae late triangulares, acutae, minute ciliolatae, persistentes. *Folia* in macrocladiis laxe sparsa, in brachycladiis sub anthesi fasciculata, tandem magis dissita, elliptica vel elliptico-oblonga, apice breviter acuminata, basi subcuneata vel rotundata, 5–14 cm. longa, 3·5–7 cm. lata, herbaceo-membranacea, primum utrinque parce pilis brevibus nitidis tenuibus conspersa supra demum glabrata subtus praesertim secus nervos pilis rigescentibus obsita; nervi laterales primarii utrinsecus 4–6; venarum reticulum laxum subtus prominens; petiolus eodem indumento ac lamina nisi densiori vestitus, 6–15 mm. longus. *Flores* 5-meri in cymas breves plerumque 3-floras tenuiter pubescentes sub brachycladiorum apices collecti; pedunculi sub anthesi 4–7 mm. longi, maturitate ad 2 cm. producti; pedicelli sub anthesi 2–3 mm. longi, maturitate ad 8 mm. elongati tunc sursum incrassati. *Sepala* tenuiter membranacea, ad margines subscariosa, rotundata, minute pubescentia et ciliolata, paulo ultra 1 mm. alta. *Petala* in corollam subglobosam conniventia, late elliptica, apice rotundata et minutissime ciliolata, 4–6 mm. longa, e luteo-viridi rubescentia. *Filamenta* petala subaequantia; antherae late ovato-oblongae, 0·6–0·7 mm. longae; thecae tota longitudine dehiscentes. *Ovarium* glabrum, disco urceolato arcte adpresso ad medium usque vel ultra cinctum; styli facile separatu coaliti, parce minuteque puberuli; stigma punctiforme. *Fructus* e mericarpiis 2 (unum saepe abortivum) compositus; mericarpia compressa, subreniformia, coerulea, exsiccando reticulato-rugosa, 8 mm. longa lataque.—O. Stapf.

The genus *Sabia*, belonging to the small but distinct order *Sabiaceae*, includes some twenty-five to thirty species, mostly climbing shrubs, fairly widely distributed in Eastern Asia. Few of these have been introduced to European gardens, and hitherto no species of the genus has been figured in this work. The one here described, *S. latifolia*, was first discovered by Mr. A. E. Pratt in the neighbourhood of Ta-chien-lu. Twenty years later it was encountered again by Mr. Wilson in the same

neighbourhood, growing in thickets at about 8,000 feet above sea-level. The plants now in cultivation were raised from seed collected by Wilson, though during the interval between its discovery and its introduction the species has been met with at least on two occasions; specimens from Szechuan were communicated by Mr. A. Henry in 1890, and others from Western Hupeh were gathered by Wilson in 1900. For the material for our figure we are indebted to Miss E. A. Willmott, in whose garden at Warley Place *S. latifolia* has been in cultivation for the past nine years. Here it has thriven against a north wall, flowering and ripening its fruits every season. The original plant, which is now about ten feet high, was raised from the only seed which germinated out of a few collected by Wilson and received from the Arnold Arboretum. At Warley Place this plant has not been given any special protection, and has proved quite hardy. Propagation has been effected by cuttings, by division, and from seed.

DESCRIPTION.—*Shrub*, 6–10 ft. high; twigs pubescent, but soon becoming glabrous, their bark green or yellowish or purpurascent. *Buds* ovoid, $\frac{1}{16}$ in. long, their scales wide triangular, acute, finely ciliolate, persistent. *Leaves* scattered on the long shoots, fascicled at flowering time but afterwards somewhat scattered on the short shoots, elliptic or elliptic-oblong, shortly acuminate, cuneate or rounded at the base, 2–5½ in. long, 1½–3 in. wide, herbaceous-membranous, at first uniformly sparingly clothed on both surfaces with thin short shining hairs, at length glabrous beneath except on the nerves where the persistent hairs become stiffer; primary lateral nerves 4–6 on each side the midrib, secondary reticulation distinct beneath; petiole more densely clothed than the leaf-blade with similar hairs, $\frac{1}{4}$–$\frac{3}{5}$ in. long. *Flowers* 5-merous, in short usually 3-flowered thinly pubescent cymes borne close under the tips of the short shoots; peduncles at flowering time $\frac{1}{6}$–$\frac{1}{4}$ in. long, in fruit $\frac{3}{4}$ in. long; pedicels at flowering time $\frac{1}{12}$–$\frac{1}{8}$ in. long, in fruit $\frac{1}{3}$ in. long and then thickened at the top. *Sepals* thinly membranous with somewhat scarious edges, rounded, very finely pubescent and ciliolate, small. *Petals* connivent in a globose corolla, each wide elliptic, rounded and finely ciliolate at the apex, $\frac{1}{6}$–$\frac{1}{4}$ in. long, greenish-yellow passing into reddish-brown. *Filaments* about as long as the petals; anthers wide ovate-oblong, very small; cells dehiscing longitudinally. *Ovary* glabrous, surrounded as far as or beyond the middle by a cupular adpressed disk; styles united, sparingly and finely pubescent; stigma minute. *Fruit* normally made up of two mericarps, one of which is often suppressed; each mericarp compressed, somewhat reniform, bright blue, reticulately rugose on drying up, about $\frac{1}{3}$ in. long, and as much across.

TAB. 8859.—Fig. 1, portion of a leaf, showing indumentum; 2, flowers; 3, a petal and stamen; 4, stamen, seen from behind; 5, pistil, in vertical section; 6, fruit, with only one mericarp developed; 7, fruit with two mericarps:—*all enlarged except* 7, *which is much reduced.*

M.S. del.,A.W.F. lith.

L.Reeve & Cº London.

Tab. 8860.

ACACIA spectabilis.

Eastern Australia.

Leguminosae. Tribe Mimoseae.

Acacia, *Willd.; Benth. et Hook. f. Gen. Plant.* vol. i. p. 594.

Acacia spectabilis, *Cunn. ex Benth. in Hook. Lond. Journ. Bot.* vol. i. p. 383 (1842); *Lindl. Bot. Reg.* vol. xxix. t. 46 (1843); *Benth. Fl. Austral.* vol. ii. p. 413 (1864), *et in Trans. Linn. Soc.* vol. xxx. p. 496 (1874); affinis *A. polybotryae*, Benth., et *A. pruinosae*, A. Cunn., ab illa foliolis paucioribus ramulis molliter pubescentibus, ab hac foliolis et capitulis majoribus differt.

Frutex elata; ramuli demum purpurascentes patule pubescentes, mox glabri. *Folia* 2-pinnata, inflorescentia vix aequilonga, circiter 6 cm. longa; pinnae 2–5-jugae; glandulae obscurae; foliola 4–8-juga, oblonga vel obovato-oblonga, apice rotundata et minute mucronata, basi rotundata et obscure 3-nervia, glabra, glauca, 5–10 mm. longa, 3–4 mm. lata; petioli molliter pubescentes. *Inflorescentia* axillaris, racemosa, usque ad 10 cm. longa; rhachis parce pubescens; pedunculi circiter 5 mm. longi, glabri; bracteae minutae, acutae. *Capitula* globosa, ad 1·3 cm. diametro, flava. *Calyx* minutus, ruber, lobis rotundatis dense ciliolatis. *Petala* basi coalita, ovato-lanceolata, subacuta, inferne abrupte angustata, 2·5 mm. longa, 1-nervia, marginibus minute papillosa. *Stamina* numerosa. *Ovarium* oblongo-ellipsoideum, glabrum; stylus fere lateralis, flavus, 2·25 mm. longus. *Legumen* 5–8 cm. longum, 1 cm. latum, rectum, planum, glaberrimum, glaucum, valvulis subcoriaceis. *Semina* 6–10, ellipsoidea, nigra, 6 mm. longa.—*A. chrysobotrys*, Meisn. ex Walp. Rep. vol. ii. p. 906 (1843).—J. Hutchinson.

Acacia spectabilis well deserves the name suggested for it by Cunningham on its first discovery in Wellington Valley, New South Wales, nearly a century ago, for in spite of the fact that as cultivated under greenhouse conditions in this country it develops into a plant of somewhat straggling habit, it is when in full blossom an exceedingly beautiful object, the glaucous hue of the foliage greatly enhancing the effect produced by the yellow globose flower-heads it produces in such abundance. A native of the subtropical regions of Eastern Australia from about Lat. 26° S. in Queensland to about 34° S. in New South Wales, it was introduced to

European collections shortly after its first discovery, and has been in cultivation in England ever since. Doubtless it has been reintroduced oftener than once; the last occasion on which this has occurred at Kew was in 1909 when seeds were received from the Sydney Botanic Garden. One of the plants raised then flowered for the first time in the Temperate House at Kew in February, 1914, when the drawing from which our plate has been prepared was made. It has flowered freely in spring every year since then. As Mr. Hutchinson points out, it is nearly related to two other Australian species of *Acacia*, *A. polybotrya*, Benth., and *A. pruinosa*, A. Cunn., both of which are to be met with in greenhouse collections.

DESCRIPTION.—*Shrub* of considerable size; twigs eventually becoming purplish, at first covered with spreading pubescence, but soon becoming glabrous. *Leaves* 2-pinnate, hardly as long as the inflorescence, over 2 in. long; pinnae 2–5-jugate; glands obscure; leaflets 4–8-jugate, oblong or obovate-oblong, rounded and finely mucronate at the tip, rounded and faintly 3-nerved at the base, glabrous, glaucous, $\frac{1}{5}$–$\frac{2}{5}$ in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. wide; petiole softly pubescent. *Inflorescence* axillary, racemose, up to 4 in. long; rhachis sparsely pubescent; peduncles about $\frac{1}{5}$ in. long, glabrous; bracts minute, acute. *Heads* globose, yellow, about $\frac{1}{2}$ in. across. *Calyx* minute, red; lobes rounded, densely ciliolate. *Petals* united below, ovate-lanceolate, somewhat acute, abruptly narrowed downwards, $\frac{1}{10}$ in. long, 1-nerved, finely papillose on the margin. *Stamens* many. *Ovary* oblong-ellipsoid, glabrous; style nearly lateral, yellow, about $\frac{1}{10}$ in. long. *Pod* 2–3 in. long, $\frac{2}{5}$ in. wide, straight, flat, quite glabrous, glaucous; valves subcoriaceous. *Seeds* 6–10, ellipsoid, black, $\frac{1}{4}$ in. long.

TAB. 8860.—Fig. 1, portion of a leaf; 2, bract; 3, flower; 4, stamen; 5, pistil:—*all enlarged.*

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M.C. del. A.W.D. lith.

London, L. Reeve & C.º

Tab. 8861.

ARISAEMA Fargesii.

China.

Araceae. Tribe Aroideae.

Arisaema, *Mart.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 965.

Arisaema Fargesii, *Buchet in Lecomte, Notul. Syst.* vol. i. p. 371 (1911); species *A. speciosum*, Mart., simulans; spadice incluso obtuso distinguitur.

Herba tuberosa. *Tuber* depresso-globosum. *Cataphylla* brunnea, superne attenuata, obtusa vel acuta. *Folia* solitaria, synanthia, 3-foliolata, glabra; foliola patentia, brevissime petiolulata, medium subrotundatum, cuspidatum, 28 cm. longum; lateralia quam medium paullo breviora, inaequilateralia; petiolus quam lamina sesquilongior, carnosus. *Pedunculus* erectus, carnosus, 15 cm. altus. *Spatha* purpurea, vittis pallidis lineata; tubus subcylindricus, 8 cm. longus, 2 cm. latus; limbus oblongo-deltoideus, longe acuminatus, galeatus, fauce valde auriculatus, 14 cm. longus, 6 cm. latus. *Spadix* unisexualis, 11 cm. longus; appendix inclusa, 8 cm. longa, supra flores contracta, deinde anguste lanceolata, obtusa, brunnea; flores foeminei basi congesti; ovarium angulatum, apice leviter hemisphericum; stylus brevissimus, crassus; stigma penicillatum; ovula pauca.—C. H. Wright.

Arisaema Fargesii was described by Mr. Buchet from specimens bearing male flowers only, collected at Hong-lan-sin, at an altitude of 6,000–7,000 feet, in the district of Tchen-keou-tin, in the province of Szechuan, but he refers to the same species a plant with female flowers, which he has seen growing in the collection of Mr. Maurice de Vilmorin, who had received it from Szechuan. This plant was larger in all its parts than the male plant upon which the original description was based, and agrees with the plant here figured, which was received at Kew in 1917 from Mr. de Vilmorin and flowered in May, 1919. The leaves of *A. Fargesii* resemble those of *A. ringens*, Schott, which differs in having a spathe with even more pronounced auricles but with a shorter apex. In colour, the spathe is like that of *A. speciosum*, Mart., but in this the spadix is produced into a long filiform appendix much longer than the spathe. The spathe in

all the above mentioned species is inarched so as to form a hood, and the whole inflorescence is sheltered by the patently spreading leaflets, which are decurved in the upper part. At Kew this species thrives well, like the various Himalayan species of the same genus, under ordinary greenhouse treatment.

Description.—*Herb*, with a depressed globose tuberous corm which produces a solitary leaf along with a solitary flower spike. *Cataphylls* brown, narrowed upwards, obtuse or acute. *Leaf* 3-foliolate, glabrous; leaflets spreading, shortly petiolulate, the central somewhat rounded, cuspidate, 11 in. long; lateral rather shorter than the central, cuneate at the base on the inner, rounded on the outer side; petiole half as long again as the lamina, fleshy. *Peduncle* erect, fleshy, 6 in. high. *Spathe* purple, marked with whitish lines; tube nearly cylindric, 3 in. long, ¾ in. across; limb oblong-deltoid, long acuminate, galeate, the throat very distinctly auricled, 5½ in. long, 2¼ in. wide. *Spadix* 1-sexual, over 4 in. long; appendix included in the spathe, 3 in. long, contracted above the flower-bearing portion, thence narrowly lanceolate upwards to the blunt tip, brown; the flowers, only females seen, congested at the base of the spadix. *Ovary* angular by compression, somewhat rounded at the tip; style very short and thick; stigma penicillate; ovules few.

Tab. 8861.—Fig. 1, female flowers; 2, a female flower in vertical section, showing ovules; 3, sketch of an entire plant:—*all enlarged except* 3, *which is much reduced.*

3.

4

5.

1.

2

M.S.del.,A.W.D.lith.

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Tab. 8862.

STRANVAESIA salicifolia.

China.

Rosaceae. Tribe Pomeae.

Stranvaesia, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 605.

Stranvaesia salicifolia, *Hutchinson*; species nova *S. undulata*, Decne, affinis sed foliis angustissimis nervis lateralibus numerosis stipulis et bracteis mox deciduis fructibus rubris nec aurantiacis differt.

Frutex vel *arbor* parva; ramuli juniores dense cinereo-tomentosi, annotini atropurpurei et adpresse pubescentes. *Folia* lineari-lanceolata, utrinque acuta, apice acuminata vel longe mucronata, integerrima, 4–9 cm. longa, 1–2 cm. lata, tenuiter chartacea, supra in costa pubescentia, ceterum glabra; nervi laterales numerosi, plerumque circiter 12, a costa sub angulo lato abeuntes, infra prominuli, bifurcati; petioli usque ad 1·5 cm. longi, dense adpresse pubescentes; stipulae sub anthesi deciduae. *Corymbi* circiter 7 cm. expansi, densiflori, ramis pedicellisque dense pubescentibus. *Receptaculum* late campanulatum, parce pubescens, circiter 2 mm. longum. *Sepala* late ovata, minute mucronata, ciliolata. *Petala* alba, orbicularia. *Stamina* circiter 20 antheris rubris. *Ovarium* supra pubescens; stylus 3 mm. longus stigmatibus capitatis. *Fructus* ruber, depresso-globosus, fere 1 cm. diametro.—J. Hutchinson.

The Rosaceous genus *Stranvaesia* includes only five or six species, closely related to each other and separable only by rather slight characters. The distribution of the various forms is interesting, for the genus extends in India from Kumaon to the Khasia Hills and Burma, and extends thence into central and western China, while a solitary species occurs at high altitudes on Mount Kinabalu in Borneo. So far no representative of the genus has been met with in the Malay Peninsula. The species here described as *S. salicifolia* is very nearly related to *S. undulata*, Decne, from China, figured at t. 8418 of this work. From *S. undulata* our plant differs in its narrower willow-like leaves, its quickly deciduous stipules and bracts, and especially in its fruits which are red in place of orange. From the horticultural standpoint at all events the two plants are abundantly distinct. Our plate has been prepared from an example which has

proved quite hardy at Kew, where it thrives well in loamy soil. It was received as a small plant from the Arnold Arboretum in 1910, and as cultivated alongside *S. undulata* has become a taller plant of much stronger growth, less compact in habit. It flowers freely and perfects its fruit in sufficient quantity to render it a singularly handsome autumn plant. It may be increased by seeds.

DESCRIPTION.—*Shrub* or small *tree* with densely grey-tomentose young twigs which become dark-purple and adpressed pubescent in the following season. *Leaves* linear-lanceolate, narrowed to both ends, acuminate or long mucronate at the tip, quite entire, $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, $\frac{2}{5}$–$\frac{4}{5}$ in. wide, thinly papery, pubescent along the midrib above, elsewhere glabrous; lateral nerves about 12 on each side the midrib which they leave at a wide angle, raised beneath, 2-furcate towards the leaf-margin; petiole over $\frac{1}{2}$ in. long, densely adpressed-pubescent; stipules very early deciduous. *Corymbs* about 3 in. across, dense-flowered, with the peduncle and pedicel densely pubescent. *Receptacle* wide campanulate, sparingly pubescent, about $\frac{1}{12}$ in. long. *Sepals* wide ovate, minutely mucronate, ciliolate. *Petals* white, orbicular. *Stamens* about 20, anthers red. *Ovary* pubescent above; style $\frac{1}{8}$ in. long; stigmas capitate. *Fruit* red, depressed-globose, about $\frac{1}{3}$ in. across.

TAB. 8862.—Fig. 1, stipules; 2, apex of leaf; 3, flower-bud; 4, section of flower; 5, seed:—*all enlarged.*

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Tab. 8833.

VERBASCUM Blattaria, var. grandiflora.

Europe.

Scrophulariaceae. Tribe Verbasceae.

Verbascum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 928.

Verbascum Blattaria, *Linn.*, var. **grandiflora,** *Turrill*, varietas nova a planta typica habitu robustiore caule altiore floribus cremeis majoribus distinguenda.

Herba; caulis circiter 1·3 m. altus, apicem versus ramis 2–3 instructus, inferne glaber, superne leviter minuteque glandulosus, foliorum caulinorum costis plus minusve decurrentibus. *Folia* basilaria in rosellam disposita, lineari-lanceolata, apice acuta, basi in petiolum angustata, 2 dm. longa, 4·5 cm. lata, profunde sinuato-lobata lobis dentatis, utrinque glabra, costa nervisque pagina superiore impressis, inferiore conspicuis; caulina breviora, ovato-lanceolata vel ovata. *Inflorescentia* terminalis, floribus in bractearum axillis solitariis; bracteae ovato-lanceolatae, attenuato-acuminatae, circiter 2·8 cm. longae, 1·3 cm. latae, inferiores majores, superiores minores, utrinque leviter glandulosae; pedicelli 1·7 cm. longi, glandulosi. *Calyx* fere ad basin in laciniis 5 divisus, nonnihil irregularis, laciniis lanceolatis acutis glandulosis, abaxialibus lateralibusque 1 cm. longis 3 mm. latis, adaxiale 9 mm. longo, 2 mm. lato. *Corolla* rotata, leviter zygomorpha, 4–5 cm. diametro, cremea, in centro purpurea et lobis adaxialibus pilis clavatis purpureis instructis, ceteroquin glabra, lobis 5 suborbicularibus 1·7 cm. longis, 2 cm. latis, 2 adaxialibus paulum minoribus. *Stamina* saepissime 5, filamentis pilis clavatis purpureis instructis, adaxiale 5 mm. longo, lateralibus 7 mm. longis, abaxialibus leviter sursum curvatis 9 mm. longis. *Ovarium* ovoideo-sphaeroideum, 3 mm. altum, 3 mm. diametro, dense papilloso-glandulosum, pallide viride; stylus 1·1 cm. longus, inferne pilis glandulosis tectus, purpureus; stigma cylindricum, integrum, viride, vix 1 mm. longum.—W. B. Turrill.

Verbascum Blattaria, well known in gardens in this country, is also to be found, as a somewhat rare alien, in waste places from Lincolnshire southwards; in some of our southern counties it may perhaps be truly native. As a wild species it is widely spread in central and southern Europe, in northern Africa and in the Orient. Though it has long been in cultivation, the plant as grown in gardens seems always to have yellow corollas, though forms with the flower more or less white have occasionally been recorded in the wild state. The form

here figured as var. *grandiflora*, in which the flowers are white and the corollas are much larger than in typical *V. Blattaria*, Linn., seems to be of doubtful origin. For the seeds from which the subject of our plate was raised Kew is indebted to the Director of the John Innes Horticultual Institution, Merton, and the original parent plant it is understood came from Lincolnshire, where it was found growing in a corn-field. At Kew it calls for no special treatment. The seeds were sown in 1918 and the plants flowered in 1919, those under greenhouse conditions in May, those in a border outside somewhat later, in both cases ripening seeds freely. Notwithstanding the striking appearance of this new variety, it differs from typical *V. Blattaria* mainly in the extreme luxuriance of all its parts.

Description.—*Herb*, biennial; stem 1½-2 ft. high, with 2–3 branches towards the top, glabrous downwards, slightly and finely glandular high up. *Leaves* of the rosette linear-lanceolate, acute, narrowed to the petiole, 8 in. long, 1¾ in. wide, deeply sinuately lobed, the lobes dentate, glabrous on both surfaces, midrib and nerves impressed above, raised beneath; of the stem shorter, ovate-lanceolate or ovate, somewhat decurrent at the base. *Inflorescence* terminal; flowers solitary in the bract-axils; bracts ovate-lanceolate, narrow acuminate, near the middle over 1 in. long, about ½ in. wide, the lower rather larger, the upper rather smaller, slightly glandular on both surfaces; pedicels about ⅔ in. long, glandular. *Calyx* somewhat irregularly divided almost to the base into 5 lanceolate, acute, glandular segments, the one nearest the axis rather smaller than the remaining, which are ⅖ in. long, ⅛ in. wide. *Corolla* rotate, slightly zygomorphic, 1¾ in. across, cream-coloured with a purple eye, the lobes next the axis with clavate purple hairs, elsewhere glabrous; lobes 5, suborbicular, ⅔ in. long, ¾ in. wide, the ones next the axis rather smaller. *Stamens* usually 5, filaments beset with purple clavate hairs, that next the axis ⅕ in. long, the lateral about ¼ in. long, the anterior slightly curved upwards, and ⅛ in. long. *Ovary* ovoid-sphaeroid, ⅛ in. long and as much across, densely glandular-papillose, pale green; style nearly ½ in. long, covered with glandular hairs below, purple; stigma cylindric, entire, green, over ⅓ in. long.

Tab. 8863.—Fig. 1, calyx and pistil; 2, base of corolla, showing the staminal insertion; 3, 4 and 5, stamens; 6, glandular hair from filament; 7, ovary; 8, sketch of upper portion of stem:—*all enlarged except* 8, *which is much reduced.*

M S del. A.W.F. lith

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Tab. 8864.

RHODODENDRON STRIGILLOSUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron strigillosum, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. p. 232 (1886), *et in Nouv. Arch. Mus. Par.* Sér. 2, vol. x. p. 49 (1887); *Hemsl. et E. H. Wils. in Kew Bull.* 1910, p. 107; *Rehd. & E. H. Wils. in Sarg. Pl. Wilson.* vol. i. p. 531 (1914); *Millais, Rhodod.* p. 248 (1917); species ramulis petiolis et pedicellis dense setosis corollis rubris basi maculis nigris notatis filamentis glabris distinctissima.

Frutex vel *arbor* usque ad 6·5 m. alta; rami apicem versus pilis longis rigidis nigricantibus dense setosi. *Folia* anguste oblongo-oblanceolata, acute acuminata, ad basin leviter angustata et breviter cordata, 7–15 cm. longa, 2–4 cm. lata, rigide coriacea vel subpapyracea, supra reticulata, infra pilis crispis strigillosa; costa media supra impressa, basin versus hispida, infra valde prominens, villoso-tomentosa; nervi laterales utrinsecus 12–18, a costa sub angulo lato abeuntes, marginem versus evanidi; petioli 1–2 cm. longi, setoso-hispidi et tomentosi. *Inflorescentia* terminalis, circiter 10-flora; bracteae extra dense lanato-tomentosae; pedicelli vix 1 cm. longi, pilis nigris apice glandulosis dense setosi. *Calyx* brevis, extra setosus. *Corolla* rubra, intus apud basin maculis nigris 5 notata; tubus anguste campanulatus, extra glaber, 3 cm. longus, apice 2·5 cm. diametro; lobi 5, rotundati, emarginati. *Stamina* 10, exserta; filamenta pallida, glabra, circiter 4 cm. longa; antherae nigrae, 3 mm. longae. *Ovarium* 5-loculare dense strigillosum; stylus staminibus paullo longiore pallide purpurascens, glaber, stigmate lobulato coronatus. *Fructus* 1·5 cm. longus, pilis rigidis purpurpeis dense setosus.—J. Hutchinson.

The distinct and striking *Rhododendron* here figured is a native of Western China and appears to be confined to the province of Szechuan where it was first met with in 1885 by the Abbé David, near Moupine, at an elevation of about 9,000 feet above the sea. The plant from which the material for our plate was cut was obtained from the nursery of Messrs. J. Veitch and Sons at Coombe Wood in 1908. It had been raised there from seeds collected in Szechuan by Mr. E. H. Wilson. This plant is now four or five feet in height and forms a well-furnished, compact and handsome bush which usually flowers at Kew in March or April. The warmth of the

early weeks of 1920 however brought the blossoms of *R. strigillosum* to perfection by the middle of February, when our drawing was prepared. This habit of early flowering renders the blossoms liable to injury by spring frost, and the young growths suffer from the same cause. It appears to succeed best in thin woodland, where it is shaded from the sun in the early and middle hours of the day. According to Mr. Millais the flowers vary in colour from rich red and crimson to white. The five black pouches at the base of the corolla are usually full of nectar. Even when out of flower *R. strigillosum* is readily distinguishable by its very bristly young shoots.

Description.—*Shrub*, 4–5 ft., or at times a *tree* up to 20 ft. high; twigs densely setose towards the tip, with long rigid blackish hairs. *Leaves* narrowly oblong-lanceolate, acutely acuminate, slightly narrowed and shortly cordate at the base, 3–6 in. long, ¾–1½ in. wide, firmly coriaceous to nearly papery, reticulated above, beset underneath with crisped hairs; midrib sunk above and hispid towards the leaf-base, much raised beneath and tomentose; lateral nerves about 12–18 along each side the midrib, from which they diverge at a wide angle, becoming obsolete towards the margin; petiole ⅛–¾ in. long, setose-hispid and tomentose. *Inflorescence* terminal, about 10-flowered; bracts densely woolly outside; pedicels about ⅓ in. long, densely setose with black gland-tipped hairs. *Calyx* short, setose outside. *Corolla* red, with 5 black basal blotches inside; tube narrow campanulate, glabrous outside, 1¼ in. long, 1 in. wide at the throat; lobes 5, rounded, emarginate. *Stamens* 10, exserted; filaments pale purple, glabrous, about 1½ in. long; anthers nearly black, ⅛ in. long. *Ovary* 5-celled, densely strigillose; style pale purple, rather longer than the stamens, glabrous, tipped by the lobulate stigma. *Capsule* about ⅔ in. long, densely setose with rigid purple hairs.

Tab. 8864.—Fig. 1, base of leaf; 2, bract; 3, calyx and pistil; 4, setose hairs; 5 and 6, stamens; 7, section of ovary:—*all enlarged.*

M.S. del., A.W.D. lith.

L. Reeve & Cº, London.

Tab. 8865.

FRITILLARIA pontica.

Orient.

Liliaceae. Tribe Tulipeae.

Fritillaria, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 817.

Fritillaria pontica, *Wahlenb. in Isis*, vol. xix. p. 984 et *in Berggr. Resor*, vol. ii. Bihang, p. 27; *Schult. Syst.* vol. vii. p. 1687; *Kunth, Enum.* vol. iv. p. 248; *Griseb. Spic. Fl. Rumel.* vol. ii. p. 383; *Baker in Journ. Linn. Soc.* vol. xiv. p. 255; *Velenovsky, Fl. Bulg.* p. 546; *Boiss. Fl. Orient.* vol. v. p. 179; *Turrill in Kew Bull.* 1918, p. 329; species affinis *F. tenellae*, M. Bieb., sed foliis latioribus superioribus ternatim verticillatis perigonii phyllis haud tesselatis facile distinguitur.

Herba. *Caulis* erectus, usque ad 4·5 dm. altus, saepissime monocephalus, inferne aphyllus, superne foliosus. *Folia* viridia, 5-7 cm. longa, 0 8–1 cm. lata, inferiora opposita vel alterna, lanceolata vel oblongo-lanceolata, apice obtusa, superiora ternatim verticillata, lanceolata, apice attenuato-acuta, glabra. *Flos* nutans. *Perianthium* campanulatum, segmentis rectis haud tesselatis, exterioribus ellipticis vel elliptico-oblanceolatis obtusis 3·5 cm. longis 1·2 cm. latis viridibus apicem versus purpureo-tinctis, interioribus subspathulatis apice obtusis 3·5 cm. longis 1·7 cm. latis viridibus parte superiore purpurea excepta, omnibus 6 mm. supra basin nectario ovato-orbiculari 4 mm. diametro leviter foveolato nigricante instructis. *Stamina* perianthio subduplo breviora, filamentis 1·1 cm. longis, antheris vix 1 cm. longis obtusis papilloso-puberulis. *Ovarium* cylindricum, 1 cm. altum, 2 mm. diametro, glabrum; stylus 8 mm. longus, glaber; stigmata 3, fere 5 mm. longa. *Capsula* oblongo-turbinata, haud stipitata, angulis alatis.—*F. olympica*, G. Koch, Linnaea, vol. xxii. p. 232; Walp. Ann. vol. iii. p. 628. *F. pyrenaica*, D'Urv. in Mém. Soc. Linn. Paris, vol. i. p. 294; nec Linn.—W. B. Turrill.

The interesting *Fritillaria* here figured is a characteristically Orient species with its headquarters in Thrace. It is reported to be plentiful near Constantinople and on the northern shores of the Bosphorus and the Sea of Marmora. Thence it extends southward into Bithynia and Anatolia, northward into Bulgaria and westward into Macedonia. It is usually found in woody places on hilly ground or among the foot-hills. The material for our plate was supplied by Mr. Hamilton Blanchard from his garden at Cotswold, Parkstone, the plant figured having been raised from a bulb sent from

Macedonia by Mr. Douglas Blanchard. To the latter we are indebted for the information that in Macedonia, as in Thrace, *F. pontica* is generally distributed and prefers shade. Most of the bulbs sent by him to his brother came from a nullah running into Gumus Dere, near Kopriva, and the Sargest, from the slopes of Black Peak near Paprat. Here *F. pontica* flourishes under the shelter of bushes at about 3,000 feet above the sea. Mr. H. Blanchard's experience with the plant extends over three seasons. The bulbs first received were all small and had been lifted very early; grown in pots in full sun the plants died without flowering. The second consignment, also lifted early, included some larger bulbs. The plants started growth too soon and were injured by spring frosts, some being cut to the ground. Grown in sandy soil with partial shade and an eastern exposure, some of them flowered when six inches high. The final consignment, of mature bulbs, grown on the north side of a high wall, produced plants which flowered when a foot high, formed capsules and matured seeds. In a soil suitable for other species of *Fritillaria* and if given sufficient shade, *F. pontica* is likely to prove hardy. The species belongs to the group *Monocodon* in which the bulbs are tunicated, the styles are tricuspidate and the nectaries are uniform. The colour of perianth appears to vary, especially in cultivated plants, between dark green upwards tinged with purple and pale yellowish-green, but the absence of tesselation is constant.

Description.—*Herb.* *Stem* erect up to 1½ ft. high, usually 1-flowered, leafy above, naked in the lower half. *Leaves* glabrous, green, 2–3 in. long, ⅓–⅖ in. wide, the lower opposite or alternate, lanceolate or oblong-lanceolate, blunt, the upper 3-nate, lanceolate, narrowed to an acute tip. *Flower* nodding. *Perianth* campanulate; segments straight, never tesselate, the outer 3 elliptic or elliptic-oblanceolate, obtuse, 1⅓ in. long, ½ in. wide, green flushed with purple towards the tip, the inner 3 subspathulate, obtuse, 1⅓ in. long, about ⅔ in. wide, green with purple tip, all with an ovate-orbicular slightly pitted nectary ⅙ in. across, situated ¼ in. above the base. *Stamens* about half as long as the perianth; filaments nearly ½ in. long, anthers about ⅖ in. long, blunt, papillose-puberulous. *Ovary* cylindric, ⅖ in. long, $\frac{1}{12}$ in. wide, glabrous; stigmas 3, nearly ⅓ in. long. *Capsule* oblong-turbinate, without a stipe, its angles winged.

Tab. 8865.—Fig. 1, perianth segment of the inner series; 2 and 3, stamens; 4, pistil: *all enlarged.*

8866.

M.S. del. A.W.D. lith.

L. Reeve & Cº London.

Tab. 8866.

MELALEUCA Radula.

West Australia.

Myrtaceae. Tribe Leptospermeae.

Melaleuca, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 705.

Melaleuca Radula, *Lindl. Swan River App.* p. 8 (1839); *Schauer in Pl. Preiss.* vol. i. p. 145; *Benth. Fl. Austral.* vol. iii. p. 141; aff. *M. linearifoliae*, Smith, foliis involutis marginatis, floribus axillaribus duplo majoribus differt.

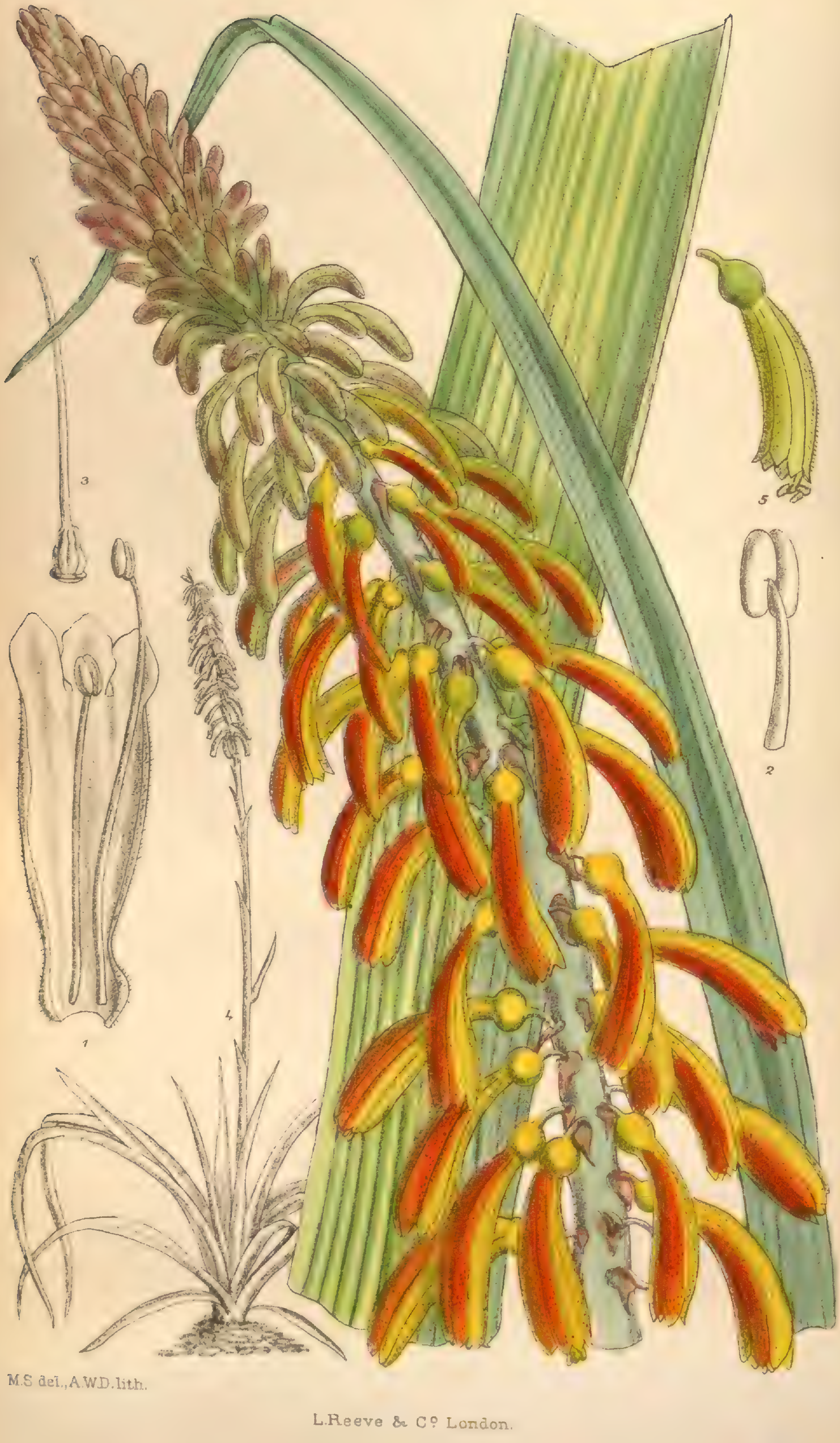
Frutex alta, virgata, glabra. *Folia* opposita, linearia, acuta, canaliculata, scabridula, marginibus concavis vel involutis, 2–4·5 cm. longa, uninervia, pellucido-punctata. *Flores* axillares, sessiles, 2–2·5 cm. diametro, lilacino-purpurei. *Calyx* glaber, 0·5–0·7 cm. latus; lobi latiores, saepe subobsoleti. *Petala* unguiculata, orbicularia, 4–5 mm. lata. *Stamina* numerosissima, circiter 1 cm. longa, basi in phalangas 5 latas connata; antherae globosae, luteae. *Ovarium* scabridulum; stylus latus; stigma subcapitatum. *Fructus* subglobosus, 6–8 mm. diametro.—**R. A. Rolfe.**

The Myrtaceous genus *Melaleuca* is a member of the tribe *Leptospermeae*, which includes many of the Australian plants that a century ago received much attention in English gardens and conservatories. The most familiar genera in the group are *Eucalyptus*, which includes the Australian Blue Gum, and whereof the species best known in our collections is the Tasmanian *E. Gunnii*, Hook. f., a mountain form of which is figured at t. 7808 of this work; *Leptospermum* itself, whereof *L. scoparium*, Forst., the Manuka of New Zealand, is most generally grown; and *Callistemon*, whereof the Australian species *C. pinifolius*, figured at t. 3989, is to be met with in English gardens. It is to the last named of these genera that *Melaleuca*, of which over a hundred species are known, is most nearly allied. Several of these have already been described in this Magazine, and will be found represented on tt. 1058, 1868, 1935, 2268, 3210, 4471, 6131, 7529, 7941. The species now described, *M. Radula*, which has not been figured hitherto,

possesses the added interest of having been unknown in European gardens even during the period when growers were less unwilling than they are to-day to take the trouble called for in the cultivation of hard-wooded Australian shrubs. The material for our plate has been obtained from a plant raised from seed received from Australia in 1906 as that of *Eucalyptus eugenioides*, which flowered at Kew in October, 1915. This name being obviously erroneous, the drawing then prepared was submitted to Mr. J. H. Maiden, Director of the Sydney Botanic Garden, to whom we are indebted for its identification. A small virgate shrub, with rather narrow spreading opposite leaves and large lilac purple flowers borne in axillary pairs, *M. Radula* flowers freely under greenhouse treatment in late autumn and is a welcome addition to conservatory collections. It is a native of Western Australia, where it was first collected in the Swan River district by Mr. James Drummond, and was first described from his specimens by Professor Lindley. Its natural range appears to be rather limited, though it is not uncommon within its special area, for it has since then been collected by Preiss near the Cunning River, by Oldfield at Champion Bay and on the Murchison River, and by more recent travellers in neighbouring districts. Its nearest ally in the genus is *M. linearifolia*, Smith, another species from Western Australia, from which *M. Radula* is readily distinguished by the involute leaf-margins, and by the larger flowers which are never, as in *M. linearifolia*, arranged in a terminal panicle.

DESCRIPTION.—*Shrub* of considerable size; branches virgate; all parts glabrous. *Leaves* opposite, linear, acute, canaliculate, finely scabrid, margins involute or concave, $\frac{3}{4}$–$1\frac{3}{4}$ in. long, 1-nerved, pellucid-dotted. *Flowers* axillary, sessile, $\frac{3}{4}$–$1\frac{1}{4}$ in. across, lilac-purple. *Calyx* glabrous, $\frac{1}{5}$–$\frac{1}{3}$ in. wide; lobes when present rather broad, but often nearly absent. *Petals* clawed, orbicular, $\frac{1}{6}$–$\frac{1}{5}$ in. wide. *Stamens* very many, over $\frac{1}{3}$ in. long, united below in 5 broad phalanges; anthers globose, yellow. *Ovary* finely scabrid; style thick; stigma subcapitate. *Fruit* nearly globose, $\frac{1}{4}$–$\frac{1}{3}$ in. across.

TAB. 8866.—Fig. 1, leaf; 2, flower-bud; 3, section of flower; 4, a phalanx of stamens; 5 and 6, anthers;—*all enlarged*.



M.S del.,A.W.D.lith.

L.Reeve & Cº London.

Tab. 8867.

KNIPHOFIA Snowdeni.

Uganda.

Liliaceae. Tribe Hemerocalleae.

Kniphofia, *Moench*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 775; *A. Berger in Engl. Pflanzenreich, Lil.-Asphod.-Aloin.* p. 31.

Kniphofia Snowdeni, *C. H. Wright in Kew Bull.* 1919, p. 264; species *K. longistylae,* Baker, proxima, perianthio pubescente differt.

Herba caespitosa. *Folia* linearia 3 cm. lata, glabra, circiter 15-nervia, integra, marginibus hyalinis. *Pedunculus* 1·2 m. altus, cylindricus; spica 3 dm. longa; bracteae ovatae, longe acuminatae, 5 mm. longae. *Perianthium* 3 cm. longum, leviter curvatum, supra ovarium constrictum, extra pubescens, costis validis instructum, rubrum vel luteum; lobi rotundati, obtusi, 2 mm. longi et lati. *Antherae* inclusae. *Ovarium* conicum; stylus triquetrus, demum exsertus.—C. H. Wright.

The *Kniphofia* which forms the subject of our plate was originally discovered in October, 1916, by Mr. J. D. Snowden of the Department of Agriculture, Uganda, growing among short grass and in small scrub on the slopes of Mount Elgon at about 8,000 to 10,000 feet above sea level. In 1918 seeds collected in the same locality were forwarded to Kew by Mr. R. A. Dummer. From these, plants were successfully raised, some of which flowered in the open in September, 1919. The plant collected by Snowden, on which the original description of our species was based, was considerably smaller than the plants raised from the seed supplied by Dummer, but did not differ in other characters. Fortunately while these were in flower Mr. Snowden, when visiting Kew while on furlough, had an opportunity of seeing them, and recognised in them, without hesitation, the species he had collected on Mount Elgon. In his original specimen the leaves are only a foot long, and the inflorescence is two feet high, whereas the plants raised at Kew reach a height of five feet, with leaves two feet long. Such dimensions Mr. Snowden assures us are often attained by the wild

plants he has seen. Mr. A. Berger has relied upon the width of the leaf as a diagnostic character in separating the species of *Kniphofia*, but while this feature may be reliable in the case of plants growing under identical conditions, it may prove less satisfactory when dealing with specimens from different localities. Another rather variable character is the colour of the flowers. These are sometimes uniformly red, sometimes uniformly yellow. In certain cases, however, the flowers though red in bud become yellow when mature. The stamens are included, but the style in the fully developed flower is shortly exserted. The nearest ally of *K. Snowdeni* is *K. longistyla*, Baker, a Nyasaland species which has a cylindric glabrous perianth, and is thus easily distinguished from the one now figured, in which the perianth is densely pubescent and is constricted above the ovary as in the Genus *Gasteria*.

DESCRIPTION.—*Herb*, with tufted linear *leaves*, 1¼ in. wide, glabrous, about 15-nerved, with entire hyaline margin. *Peduncle* 5 ft. high, cylindric; spike 1 ft. long; bracts ovate, long acuminate, ⅛ in. long. *Perianth* 1¼ in. long, slightly curved, constricted above the ovary, pubescent outside, strongly ribbed, red or yellow; lobes rounded, blunt, about ½ in. long and wide. *Anthers* included. *Ovary* conical; style 3-quetrous, at length exserted.

TAB. 8867.—Fig. 1, longitudinal section of perianth; 2 anther; 3, pistil; 4, sketch of an entire plant; 5, flower from a plant in which all the flowers were uniformly yellow:—*all enlarged except* 4, *which is much reduced, and* 5, *which is of natural size.*

M.S. del., A.W.D. lith.

L. Reeve & Co London.

Tab. 8868.

ERICA sessiliflora.

South Africa.

Ericaceae. Tribe Ericeae.

Erica, *Linn; Benth. et Hook. f. Gen. Plant.* vol. ii. p 590.

Erica sessiliflora, *Linn. f., Suppl. Plant.* p. 222; *Benth. in DC. Prodr.* vol. vii. p. 625; *Guthrie et Bolus in Dyer, Fl. Cap.* vol. iv. p. 55; species affinis *E. gilvae*, Wendl., sed floribus sessilibus, corollis angustioribus basi teretibus facile distinguitur.

Suffrutex erecta, ramosa, 5 dm. alta, trunco basi 8 mm. diametro, pallide brunneo. *Folia* 4-natim verticillata, lineari-subulata, apice acuminato-cuspidata, basi in petiolum contracta, inferiora 8–9 mm. longa, superiora 5–6 mm. longa, 0·75 mm. lata, pallide viridia, costa alba instructa, inferiora pagina superiore leviter minuteque puberula, superiora margine ciliolulata, ceterum glabra; petiolus hyalinus, basi in pulvinum ampliatus, in foliis inferioribus vix 1 mm. longus, in superioribus 2 mm. longus. *Flores* e foliorum superiorum axillis orti, sessiles; bracteae vel folia florifera foliis superioribus similes; bracteolae 6, inferiores lineari-lanceolatae, 4 mm. longae, superiores lineari-spathulatae, 7 mm. longae, 1·5 mm. latae. *Sepala* 4, lineari-spathulatae, apice acuta, 6·5 mm. longa, hyalina. *Corolla* cylindrico-infundibuliformis, 2·6 cm. longa, basi 1 mm. diametro, fauce 3 mm. diametro, flavo-virescens, glabra; lobi 4, obtusi, 1 mm. longi, 2·5 mm. lati. *Stamina* 8, haud exserta, filamentis 2·2 cm. longis, gracilibus, antheris 2 mm. longis basi dorso cornubus duobus instructis. *Ovarium* cylindricum, 1·5 cm. altum, 1·25 mm. diametro, 8-sulcatum, glabrum; stylus 2·5 cm. longus, glaber; stigma fere planum.—*E. cephalotes*, Willd. ex Steud. Nomen. ed. 2, vol. i. p. 570; nec Thunb. *E. spicata*, Thunb. Diss. p. 43, t. 4; Andr. Heathery, t. 45, et Col. Heaths, t. 61; Wendl. Eric. Ic. fasc. 2, p. 27; Lodd. Bot. Cab. t. 1203. *E. favosa*, Salisb. Prodr. p. 298 et in Trans. Linn. Soc. vol. vi. p. 365.—W. B. Turrill.

This South African Heath is rather widely spread in the Coast Region of Cape Colony. It has been frequently reported from the Cape, Stellenbosch, Paarl, Tulbagh and Caledon Divisions, is not uncommon in George and Knysna, and has been found as far east as Humansdorp. With so wide a range it is hardly surprising that there should be a considerable degree of variation in some of its characters, more especially the length and width of the corolla and the size, shape and margins of the sepals. This variability is reflected in the synonomy which

indicates a tendency during the period when the cultivation of Cape Heaths was popular to place undue reliance on characters, derived from the corolla, that South African field-botanists have found to be unstable. The late Mr. Bolus, one of the most distinguished of these, has recognised three segregates from the type, to which our plant appears to belong; in so doing, however, he has relied on differences in the calyx alone, and has not suggested that his segregates are more than varieties. For the reintroduction of this species to Kew we are indebted to the Director of the National Botanic Garden at Kirstenbosch, from whom seeds were received in February, 1915. One of the plants raised from these seeds flowered in a greenhouse at Kew in June, 1919. A plant of sturdy habit and robust growth, *E. sessiliflora* is striking on account of its semi-transparent flowers. A member of the subgenus *Syringodea*, it has been placed in the *Mammosae* group of the section *Pleurocallis* and is allied, though not very closely, to *E. gilva*, Wendl., from which it is easily distinguished by its sessile flowers and different corolla. It is readily separated from *E. Broadleyana*, Andr., and *E. Bowieana*, Lodd., by its dense close spike, from *E. mammosa*, Linn., by the corolla being terete at the base, and from *E. filipendula*, Benth., by the ovary being sessile.

Description.—*Undershrub*, 1½–1¾ ft. high, erect and branched, the stem ⅓ in. thick at the collar, pale brown. *Leaves* 4-nately whorled, linear-subulate, sharply cuspidate, narrowed below to the petiole, those lower down about ⅓ in., those highest up about ¼ in. long, very narrow, pale green with a white midrib, the lower leaves slightly and finely puberulous on the upper side, the upper leaves with finely ciliolate edges but elsewhere glabrous; petiole hyaline, pulvinate at the base, very short in the lower leaves, $\frac{1}{12}$ in. long in those higher up. *Flowers* sessile in the axils of the uppermost leaves; bracts resembling the upper leaves; bracteoles 6, the lower linear-lanceolate, ⅙ in. long, the upper linear-spathulate, over ¼ in. long. *Sepals* 4, linear-spathulate, acute, ¼ in. long, hyaline. *Corolla* narrowly funnel-shaped, about 1 in. long, $\frac{1}{24}$ in. wide at the base, ⅛ in. wide at the top, yellowish-green, glabrous; lobes 4, blunt, $\frac{1}{10}$ in. wide. *Stamens* 8, included; filaments over ¾ in. long, slender; anthers $\frac{1}{12}$ in. long, with 2 basal processes behind. *Ovary* cylindric, $\frac{1}{16}$ in. long, $\frac{1}{20}$ in. across, 8-grooved, glabrous; style 1 in. long, glabrous; stigma almost flat.

Tab. 8868.—Fig. 1, leaves; 2, flower, with bracteoles; 3 and 4, stamens; 5, pistil:—*all enlarged.*

M.S. del.,A.W.D. lith.

L. Reeve & Cº London

Tab. 8869.

SYRINGA reflexa.

Central China.

Oleaceae. Tribe Syringeae.

Syringa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 675.

Syringa reflexa, *C. K. Schneider in Fedde, Rep. Sp. Nov.* vol. ix. p. 80, *Handb. Laubholzk.* vol. iii. p. 779, fig. 488 i–m et fig. 489 d–e, *et in Sargent, Plant. Wils.* vol. i. p. 297; *E. H. Wils., Photogr.* no. 092; species sectionis *Villosae* inflorescentia pendula distincta, *S. Sargentianae,* C. K. Schneider, proxima, foliis non vel breviter acuminatis minus pubescentibus, inflorescentia pendula, calyce parce pubescenti vel glabrato, fructu verruculoso differt.

Frutex ad 4·5 m. altus. *Ramuli* obscure quadrangulati, lenticellis conspicuis copiose obtecti, annotini glabri, grisei, hornotini virides, parce breviterque pubescentes. *Folia* petiolata, elliptico-oblonga, obovata vel interdum late lanceolata, apice acuta vel breviter acuminata, basi plus minusve cuneata, rarius paulum rotundata, integra vel leviter repanda, 7–15 cm. longa, 3·5–8 cm. lata, prominenter venosa, subtus praecipue ad nervos primarios parce pilosa, demum subglabrescentia, supra saturate viridia, subtus pallidiora; petiolus 1–2 cm. longus, crassus, supra canaliculatus. *Inflorescentia* terminalis, pendula, oblongo-ovoidea vel subcylindrica, densa, ad 14 cm. longa, medio circiter 4 cm. lata, rhachi crassa parce pilosa dense albido-lenticellata. *Flores* fasciculati vel subverticillati, interdum ad ramos abbreviatos dispositi. *Pedicelli* 1·5–4 mm. longi, pubescentes. *Calyx* cupularis, circiter 2·5 mm. longus, 5-denticulatus, parce pubescens vel glabratus. *Corolla* extra pallide purpureo-rubra, lobis intus albidis; tubus anguste infundibuliformis, 1 cm. longus, basi 1·5 mm. apice 4 mm. latus; lobi patentes, ovati, 3–4 mm. longi, apice apiculati inflexi. *Antherae* inclusae, oblongae, 2·5 mm. longae. *Ovarium* obovoideo-globosum, 1 mm. longum, 1·25 mm. latum, glabrum; stylus glaber, stigmate clavato apice leviter 2-fido incluso 4 mm. longus. *Fructus* cylindricus vel subfusiformis, rectus vel leviter curvatus, apiculatus vel obtusus, 12–15 mm. longus, 2·5–3·5 mm. crassus, verruculosus.—S. A. Skan.

This *Syringa* was discovered by Prof. Henry at Fang in the Province of Hupeh, Central China, at 8,000 to 9,000 feet, but his material, collected in 1889, was not described till 1910, when specimens collected by Mr. E. H. Wilson in the same province between 1901 and 1910 had been received. Mr. Wilson sent seeds to the Arnold Arboretum and was thus the means of introducing the species into cultivation. The plants at Kew were raised from seeds received from the Office of Woods, Forests and Land Revenues in 1911, and are now

about five feet high. While closely resembling in foliage and flowers several other cultivated species, it is very distinct in its pendulous inflorescence, a character well shown in Mr. Wilson's excellent photograph. Though probably most nearly allied to *S. Sargentiana*, C. K. Schneider, our plant has much in common with *S. villosa*, Vahl, which, however, besides having an erect and much broader inflorescence, may be distinguished by its fruits, which are straight and wartless. Nine other species of *Syringa* have been figured in this Magazine including the Common Lilac, *S. vulgaris*, Linn., in 1792 (t. 183), and *S. persica*, Linn., in 1800 (t. 486). The former, the 'Lylac Mathioli' and 'Blew Pipe' of the old herbalists, is included in the catalogue of Gerard's garden published in 1596. *S. persica* was in Tradescant's garden prior to 1640; according to Parkinson's Theatrum. In 1876, when the part of Bentham and Hooker's 'Genera Plantarum' containing the *Oleaceae* appeared, only 6 species of the genus *Syringa* were known. Now there are upwards of 30, mostly natives of China, many of which have been discovered and introduced into European and American gardens since the beginning of the present century. *S. reflexa* thrives in rich loamy soil, and can be increased by cuttings of leafy shoots put in gentle heat towards the end of July.

DESCRIPTION.—*Shrub*, up to 15 ft. high; twigs faintly 4-angled, copiously lenticellate, green and sparingly shortly pubescent in their first year, grey and glabrous by the second season. *Leaves* petioled, elliptic-oblong, obovate or sometimes wide lanceolate, acute or shortly acuminate, base more or less cuneate or occasionally slightly rounded, entire or faintly repand, $2\frac{3}{4}$–6 in. long, $1\frac{1}{2}$–3 in. wide, distinctly veined, sparingly pilose especially on the main nerves beneath, but at length nearly glabrous, dark green above, paler beneath; petiole $\frac{1}{3}$–$\frac{3}{4}$ in. long, stout, channelled above. *Inflorescence* terminal, pendulous, oblong ovoid or nearly cylindric, dense, nearly 6 in. long, about $1\frac{2}{5}$ in. wide at the middle, rachis stout, sparingly pilose and closely white lenticellate. *Flowers* fascicled or almost whorled, sometimes borne at the tips of very short branchlets; pedicels $\frac{1}{16}$–$\frac{1}{6}$ in. long, pubescent. *Calyx* cupular, about $\frac{1}{10}$ in. long, 5-toothed, sparingly pubescent or glabrate. *Corolla* pale purplish-red outside, lobes whitish within; tube narrow funnel-shaped, over $\frac{1}{3}$ in. long, $\frac{1}{16}$ in. wide at the base, $\frac{1}{6}$ in. wide at the top; lobes spreading, ovate, $\frac{1}{8}$–$\frac{1}{6}$ in. long, apiculate and inflexed at the tip. *Anthers* included, oblong, $\frac{1}{10}$ in. long. *Ovary* obovoid-globose, very small, glabrous; style glabrous, $\frac{1}{6}$ in. long including the clavate very shortly 2-fid stigma. *Fruit* cylindric or somewhat fusiform, straight or slightly curved, apiculate or blunt, $\frac{3}{4}$–$\frac{2}{3}$ in. long, $\frac{1}{10}$–$\frac{1}{7}$ in. thick, finely warted.

TAB. 8869.—Fig. 1, flower; 2, calyx and pistil; 3, corolla; 4 and 5, anthers; 6 and 7, fruits:—*all enlarged except* 6, *which is of natural size.*

M.S. del. et Lith.

L.Reeve & Cº London

Tab. 8870.

PHLOMIS spectabilis.

Western Himalaya, Afghanistan and Baluchistan.

Labiatae. Tribe Stachydeae.

Phlomis, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1214.

Phlomis spectabilis, *Falc. ex Benth. in DC. Prodr.* vol. xii. p. 542; *Hook. f. Fl. Brit. Ind.* vol. iv. p. 692: species ex affinitate *P. macrophyllae*, Wall., et *P. tuberosae*, Linn., ab illa foliis infra canescenti-tomentosis, caule terete, floribus majoribus, ab hac etuberosa, caule multo altiore terete, verticillastris remotioribus, floribus majoribus differt.

Herba perennis. *Caulis* erectus, parce ramosus, robustus, teres, fere ad 2 m. altus, 5–10 mm. crassus, interdum primo plus minusve stellatim canescenti-tomentosus, rarius parce hispidus, demum glaber et saepe glaucus, internodiis elongatis interdum ad 22 cm. longis. *Folia* petiolata, ovato-cordata, apice subacuta vel rotundata, basi profunde et aperte cordata vel superiora cuneata vel rotundata, grosse et irregulariter crenata, interdum leviter lobata, superiora saepe subregulariter dentata vel serrato-dentata, supra viridia, parce pilosa, infra stellatim canescenti-tomentosa, nervis primariis conspicuis; folia basilaria 20–30 cm. longa, 15–27 cm. lata, petiolo hispido 15–30 cm. longo; folia caulina gradatim minora, inferiora ad 15 cm. longa et 11 cm. lata, petiolo 1–10 cm. longo, superiora ad bracteas reducta. *Verticillastri* 3–9, saepe 4–6, 5–15 cm. distantes, ad 30-flori. *Bracteolae* aciculares, ad 14 mm. longae, parcissime hispidulosae. *Calyx* tubuloso-infundibuliformis, 11–12 mm. longus, pilis stellatis brevibus rigidulis leviter obtectus, 10-nervis, late 5-lobus; lobi erecti, 1–1·5 mm. longi, emarginati; nervi validiores 5 in aristas 3–7 mm. longas producti. *Corolla* pallide roseo-purpurea lobo intermedio labii antici saturatiore; tubus tubuloso-infundibuliformis calycem aequans, intra basi piloso-annulatus; labium posticum ringens, oblongo-obovatum, 1·5 cm. longum, 1 cm. latum, apice paucidentatum, dorso dense villosum, intra et margine dense albido-barbatum; labium anticum patens, 3-lobum, 1·8 cm. longum, lobo intermedio orbiculari-obovato emarginato circiter 1 cm. lato, lobis lateralibus ovatis 5 mm. longis 4 mm. latis. *Stamina* e tubo longe exserta, subaequilonga; filamenta arcuata, parce lanata, 2 postica basi calcare lineare curvato 4–5 mm. longo instructa; antherae glabrae. *Stylus* glaber staminibus paulum longior, inaequaliter 2-fidus. *Nuculae* (immaturae) subglobosae, apice parcissime glanduloso-pilosae. *Discus* carnosus, albus, leviter 4-denticulatus.—*P. cachemeriana*, Benth. in DC. Prodr. vol. xii. p. 552; non Royle.—S. A. Skan.

This handsome *Phlomis* was first discovered in Kashmir by Victor Jacquemont during his travels in

October–December, 1920.

Northern India in 1828–32. It has since been collected by several travellers in the same region, growing at elevations of from 3,000 to 8,000 ft., in the Kurrum Valley, Afghanistan, by Dr. Aitchison; and at Ziarat, Baluchistan, at 8,500 ft., by the late Mr. J. H. Lace. It does not appear to have been introduced into cultivation in this country till Mr. H. J. Elwes obtained seeds collected in Kashmir by Mr Radcliffe of the Forest Department, from which he raised some plants in his garden at Colesborne, Gloucestershire; from these he sent flowering material to Kew in September, 1916, and again in August, 1919. Attaining as it does a height of about six feet, with basal leaves up to a foot long and dense whorls of rather large rose-purple flowers, it forms a striking object in the herbaceous border. It is easily cultivated, Mr. Elwes informs us, in any soil and is quite hardy in the open. The genus *Phlomis* now comprises over eighty species, about twenty of which are or have been in cultivation. The well-known *P. fruticosa*, L., a native of South-eastern Europe, is occasionally found naturalised in England. In the Flora of British India it is suggested that *P. oreophila*, Kar. and Kir., from Alatau, is probably a small state of *P. spectabilis*. The two species are manifestly quite distinct. The plant now figured is assigned by Bentham to the first (*Euphlomis*) of the two sections into which the species of *Phlomis* are grouped. The flowers are, however, much more correctly described in the definition of the section *Phlomidopsis*, which includes *P. tuberosa* and *P. macrophylla*, species obviously closely allied to *P. spectabilis*.

Description.—*Herb*, perennial. *Stem* erect, sparingly branched, stout, cylindric, about 6 ft. high, $\frac{1}{5}$–$\frac{2}{5}$ in. thick, sometimes at first more or less stellately hoary-tomentose, rarely sparingly hispid, at length glabrous and often glaucous; internodes long, sometimes over 8 in. long. *Leaves* petioled, ovate-cordate, subacute or rounded at the tip, deep and widely cordate at the base or in the upper parts of the stem, cuneate or rounded, coarsely and irregularly toothed or at times faintly lobed, upper leaves often almost regularly dentate or serrate, green and sparsely pilose above, stellately hoary-tomentose beneath, main-nerves conspicuous; basal leaves 8–12 in. long, 6–11 in. wide; petiole hispid, 6–12 in. long; stem leaves gradually smaller upwards, the lowest 6 in. long, over 4 in. wide, with petiole from $\frac{1}{4}$–4 in. long, the uppermost reduced to bracts. *Flower-whorls* 3–9, most often 4–6, 2–6 in. apart, sometimes 30-flowered. *Bracteoles* acicular, over $\frac{1}{2}$ in. long, sparingly hispidulous. *Calyx* tubular funnel-shaped, about $\frac{1}{2}$ in. long, sparsely

beset with short rather stiff stellate hairs, 10-nerved, widely 5-lobed, lobes erect, very short, emarginate, the 5 strongest nerves produced into awns $\frac{1}{8}$–$\frac{1}{4}$ in. long. *Corolla* pale rose-purple, with the midlobes of the lower lip deeper in shade; tube tubular funnel-shaped, as long as the calyx, with a ring of hairs at the base within; upper lip gaping, oblong-obovate, nearly $\frac{2}{3}$ in. long, over $\frac{1}{3}$ in. wide, sparingly toothed at the tip, densely villous on the back, densely white bearded within and on the margin; lower lip spreading, 3-lobed, $\frac{3}{4}$ in. long, mid-lobe orbicular-obovate, marginate, over $\frac{1}{3}$ in. wide, side-lobes ovate, $\frac{1}{5}$ in. long, $\frac{1}{6}$ in. wide. *Stamens* far exserted, nearly equal; filaments curved, sparingly woolly, the 2 posterior with a curved linear basal spur about $\frac{1}{6}$ in. long; anthers glabrous. *Style* glabrous, rather longer than the stamens, unequally 2-fid. *Nutlets* (unripe) subglobose, sparingly glandular-hairy at the apex. *Disk* fleshy, white, sharply 4-denticulate.

Tab. 8870.—Fig. 1, calyx and bracteoles; 2, section of base of the corolla-tube, showing stamens; 3 and 4, anthers; 5, pistil:—*all enlarged.*

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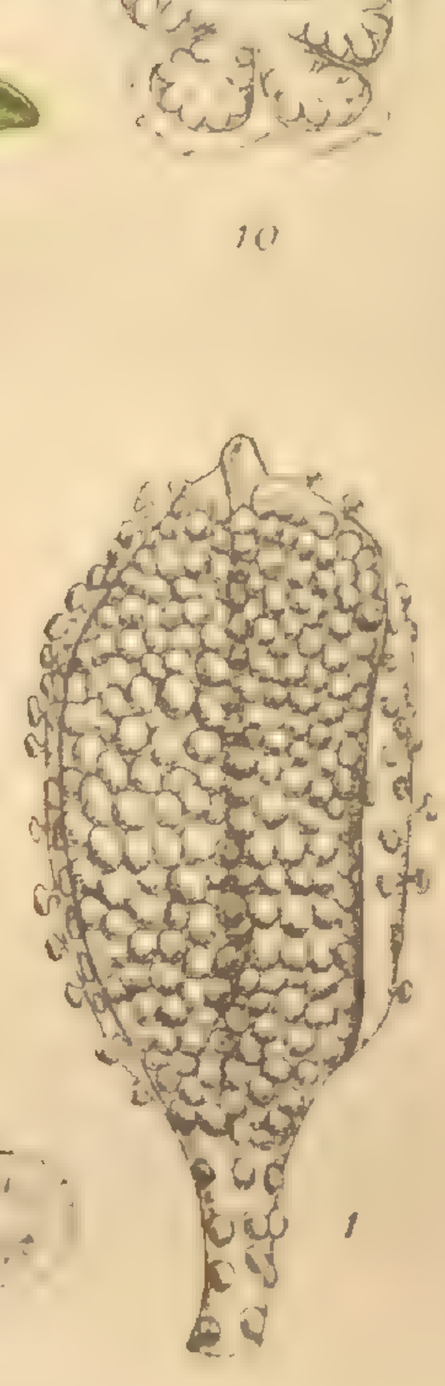

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M.S. del. A.W.D. lith

L. Reeve & Co. London

Tab. 8871.

RHODODENDRON Sargentianum.

Szechuan.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Sargentianum, *Rehder et E. H. Wils. in Sargent, Pl. Wils.* vol. i. p. 504 (1913); *Balf. f. in Notes, Roy. Bot. Gard. Edinb.* vol. ix. p. 316 (1916); *Millais, Rhodod.* p. 238 (1917); species microphylla, foliis supra nitidis infra spongioso-lepidotis, floribus pallide flavis extra lepidotis, filamentis glabris valde distincta.

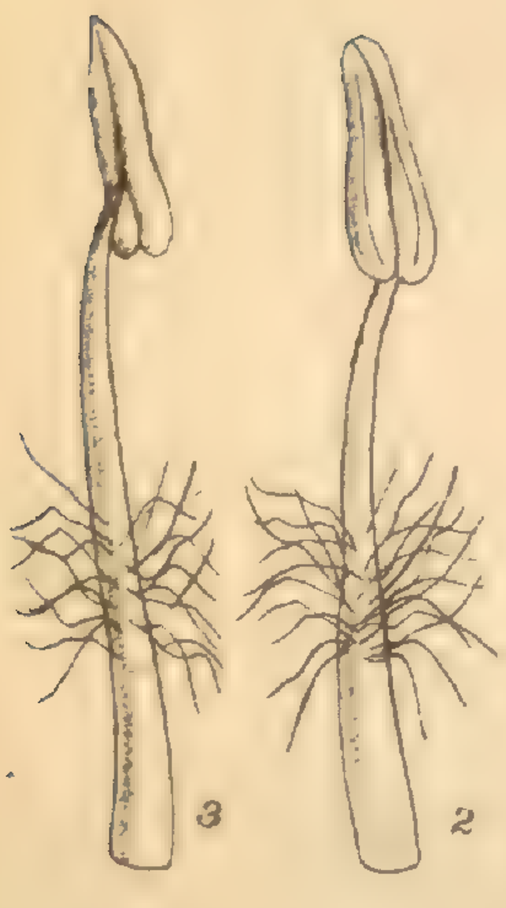
Fruticulus usque ad 60 cm. altus, erectus, ramosissimus, ramis erectis vel adscendentibus vetustioribus perulis persistentibus munitis hornotinis brevisissimis laxe spongioso-lepidotis. *Folia* aromatica, late elliptica, mucronata, interdum leviter emarginata, basi in petiolum circiter 2 mm. longum dorso lepidotum late cuneata, 0·8–1·5 cm. longa, 5–8 mm. lata, coriacea, supra primum laxe lepidota mox nitida et glabra, infra spongioso-lepidota; costa media supra impressa, infra prominens et glabrescens. *Flores* laxe umbellato-racemosi, pallide lutei; perulae subpersistentes, late obovatae, longe ciliatae, lepidotae, pedicellis aequilongae; pedicelli 5–8 mm. longi, flavido-lepidoti. *Calyx* viridis, bene evolutus, lobis oblongis 4 mm. longis apice rotundatis longe ciliatis dorso laxe lepidotis. *Corolla* hypocrateriformis, extra loborum marginibus exceptis lepidota; tubus late cylindricus, fere 1 cm. longus, intus villosus; lobi 5, patuli, suborbiculares, 4–6 mm. diametro. *Stamina* 5, corollae tubo inclusa; filamenta plerumque antherifera, circiter 4 mm. longa, glabra. *Ovarium* subglobosum, 5-loculare, flavido-lepidotum; stylus glaber, staminibus brevior, persistens, stigmate lobulato coronatus. *Fructus* subglobosus, circiter 4 mm. longus, basi calyce indurato suffultus.—J. Hutchinson.

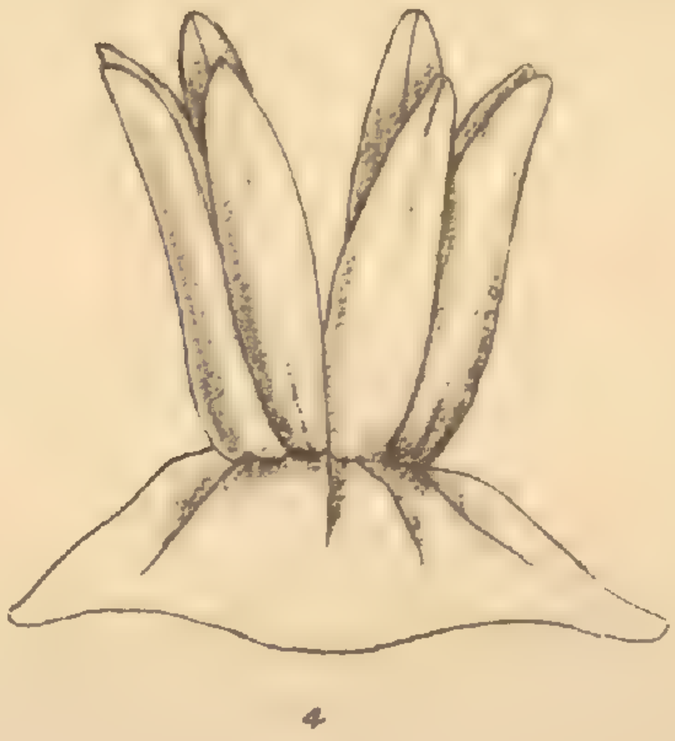
Rhododendron Sargentianum is a member of a group of some fifteen species of dwarf shrubby Rhododendrons with aromatic leaves, clustered capitulate inflorescences, tubular corollas that are usually villous within, short included stamens and very short capsules which are more or less invested by the hardened calyx. The species was discovered by Mr. E. H. Wilson in 1903 near Washan in Western Szechuan, when collecting on behalf of Messrs. J. Veitch and Sons, and was again met with by him, growing on exposed rocks near Moupine in the same province both in 1908 and in 1910. The central species of the group to which it belongs is *R.*

cephalanthum, Franch., also from south-western China. As is shown in our illustration, at fig. 8, the plant from which our figure was prepared has some of its filaments devoid of anthers; that this reduction may have been the result of cultivation is probable; the presence of the tendency may nevertheless have some bearing on the taxonomic status of the group to which *R. Sargentianum* belongs. Being dwarf, compact and slow of growth, this species is admirably suited for cultivation in the Rock Garden, where it should be provided with a mixture of sandy loam and peat. It will probably thrive best in a nook shaded from the mid-day sun. Failing seed, it can be propagated by cuttings taken in July and placed in very sandy soil under a bell-glass in gentle heat. The plant now figured was presented to Kew by Mr. F. R. S. Balfour of Dawyck, Peebleshire, in March, 1914. It flowers in May.

DESCRIPTION.—*Undershrub*, reaching a height of 2 ft., much branched, the twigs erect or ascending, when young very short and loosely covered with soft scales, when older beset with persistent bud-scales. *Leaves* aromatic, wide elliptic, mucronate, sometimes slightly emarginate, base wide cuneate passing into a stalk about $\frac{1}{12}$ in. long which is lepidote on the back, $\frac{1}{3}$–$\frac{3}{5}$ in. long, $\frac{1}{5}$–$\frac{1}{3}$ in. wide, coriaceous, at first loosely lepidote above, but soon glabrous and polished, below softly lepidote; midrib sunk above, raised and nearly glabrous beneath. *Flowers* loosely umbellately racemose, pale yellow; bud-scales somewhat persistent, wide obovate, long-ciliate, lepidote, about as long as the pedicels which are $\frac{1}{5}$–$\frac{1}{3}$ in. long and covered with yellow scales. *Calyx* green, fairly large, lobes oblong, $\frac{1}{6}$ in. long, rounded at the tip, long ciliate, loosely lepidote behind. *Corolla* hypocrateriform, lepidote outside except on the margins of the lobes; tube wide cylindric, over $\frac{1}{3}$ in. long, villous within; lobes 5, spreading, nearly orbicular, $\frac{1}{6}$–$\frac{1}{4}$ in. across. *Stamens* 5, included; filaments usually antheriferous, occasionally sterile, about $\frac{1}{6}$ in. long, glabrous. *Ovary* subglobose, 5-celled, yellow lepidote; style glabrous, shorter than the stamens, persistent, tipped by the lobulate stigma. *Capsule* subglobose, about $\frac{1}{6}$ in. long, clothed at the base by the hardened calyx.

TAB. 8871.—Fig. 1, leaf; 2, scales; 3, calyx and pistil; 4, corolla, laid open; 5, back of corolla-lobe; 6 and 7, stamens; 8, filament without anther; 9, pistil; 10, transverse section of ovary:—*all enlarged.*





M.S. del, A.W.D. lith.

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Tab. 8872.

MESEMBRYANTHEMUM DICHROUM.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 853.

Mesembryanthemum (§ Calamaformia) **dichroum**, *Rolfe*; species nova e grege *Calamiformium* foliis triquetris et petalis dichrois facile distinguendum.

Herba breviter caulescens. *Caules* simplices vel parce ramosi, suberecti, 8–9 cm. longi. *Folia* 4–6, patentia, lineari-oblonga, acuta, triquetra, crassa, supra concava, subtus obtuse carinata, glauca, crebre et minute puncticulata, 4–6 cm. longa, 0·6–0·9 cm. lata, margine minutissime denticulata. *Flores* subsessiles, expansi 3·5–4 cm. diametro, albo-rosei. *Calyx* late campanulatus; lobi deltoideo-ovati, acuti. *Petala* numerosissima, patentia, circiter 1·8 cm. longa, basi alba, apice rosea. *Stamina* numerosa, erecta, circiter 1·5 cm. longa; filamenta albidula, infra medium villosa; antherae ovato-oblongae, obtusae, flavae. *Stigmata* 6, subclavata, brevia. —R. A. Rolfe.

This distinct and striking *Mesembryanthemum* was presented to Kew in 1910 along with various other succulent plants by Mr. G. H. Simpson Hayward, Icomb Place, Stoke-on-the-Wold. It has thriven satisfactorily under the treatment given to other species of the genus in a warm greenhouse, where it flowered in November, 1918, when our figure was prepared. Beyond the fact that it is South African nothing is known of its history, for there is no record of the district in which it was collected, and no very near affinity can be found or claimed for this species, which is new alike to horticulture and to science. In most respects *M. dichroum* accords with the members of the section *Calamiformia*, though it is at once distinguishable from all of these by having distinctly triquetrous in place of subterete leaves and in having petals with bright pink apices. It appears on the whole more satisfactory to include our plant provisionally among the *Calamiformia*, though as a somewhat anomalous member of the section, than to regard it as the type of a distinct section, though this

may eventually be found to be necessary. *M. dichroum* is a pleasing addition to the succulents in cultivation owing to the colouring of the petals. It is a dwarf plant with very glaucous linear-oblong leaves and with shortly pedicelled flowers; the petals, otherwise white, are strongly suffused with pink towards their tips.

DESCRIPTION.—*Herb*, with short simple or sparingly branched suberect stems, 3–3½ in. high. *Leaves* 4–5, spreading, linear-oblong, acute, 3-quetrous, thick, concave above, bluntly keeled beneath, glaucous, closely and finely toothed. *Flowers* nearly sessile, 1½–1¾ in. across, white flushed with rose-pink. *Calyx* wide campanulate; lobes deltoid ovate, acute. *Petals* very many, spreading, about ¾ in. long, white below, rose-pink at the tips. *Stamens* many, erect, about ⅔ in. long; filaments whitish, villous below the middle; anthers ovate-oblong, obtuse, yellow. *Stigmas* 6, subclavate, short.

TAB. 8872.—Fig. 1, portion of a leaf, showing the apex; 2 and 3, stamens; 4, apex of ovary, with stigmas:—*all enlarged.*

M.S. del., A.W.D lith.

L. Reeve & Cº London.

Tab. 8873.

ODONTOGLOSSUM Humeanum.

South Mexico.

Orchidaceae. Tribe Vandeae.

Odontoglossum, *H. B. et K.; Benth. et Hook. f. Gen. Plant.* vol. iii. p. 561.

Odontoglossum Humeanum, *Reichb. f. in Gard. Chron.* 1876, vol. v. p. 170; *Reichenbachia,* ser. 1, vol. ii. p. 75, t. 82; *Cogn. et Gooss. Dict. Ic. Orch., Odontoglossum,* t. 7; *Rolfe in Orch. Rev.* 1901, p. 260; 1919, pp. 4, 41; inter *O. maculatum* et *O. Rossii* hybridum.

Herba epiphytica; pseudobulbi aggregati, ovoideo-elliptici, subcompressi, 4–6 cm. longi, basi vaginis ovato-lanceolatis obtecti, apice monophylli. *Folia* lanceolato-oblonga, acuta, basi conduplicata et attenuata, 8–20 cm. longa, 2·5–4 cm. lata. *Pedunculi* suberecti vel arcuati, 15–20 cm. longi, 3–4-flori. *Flores* speciosi, pallide lutei, sepalis et petalorum basibus brunneo-maculatis; bracteae ovato-lanceolatae, acutae, 2–2·5 cm. longae; pedicelli 3·5–5 cm. longi. *Sepala* oblongo-lanceolata, acuminata, 3·5–4 cm. longa. *Petala* elliptica, acuta, subundulata, 3·5 cm. longa, apice subrecurva. *Labellum* late unguiculatum, 3-lobum, 3 cm. longum et latum; lobi laterales parvi, subconcavi, lobus intermedius ample subcordato-orbicularis, subundulatus; discus crista crassa apice 2-loba instructus. *Columna* clavata, 2 cm. longa, alis subobsoletis.—*Odontoglossum cordatum,* Paxt. Mag. Bot. vol. xiii. p. 147, tab. ic.; non Lindl. *O. aspersum,* Reichb. f. in Gard. Chron. 1879, vol. xi. p. 266; Warn. Orch. Alb. vol. vi. t. 245; Lindenia, vol. xv. t. 679 (var. *Bosscherianum*). *O. Youngii,* Gower in Orch. Alb. vol. ix. t. 406; Rolfe in Gard. Chron. 1891, vol. x. p. 670. *O. Ashworthianum,* Hort. ex Gard. Chron. 1898, vol. xxiii. p. 189; Orch. Rev. 1898, p. 126. *O. Rossii,* var. *Humeanum* et var. *aspersum,* Veitch, Man. Orch. pars 1, p. 65.—R. A. Rolfe.

The history of this handsome *Odontoglossum* is of unusual interest. The late Professor Reichenbach in 1876 described as *O. Humeanum* a plant imported from Mexico which had then flowered in the collection of Mr. W. Burnley Hume. The characters were such as to lead Reichenbach to think it a natural hybrid; the parents suggested were *O. Rossii* and *O. cordatum,* two Mexican species described by Professor Lindley. Three years later another plant flowered with Messrs. J. Veitch and Sons. This Reichenbach described as *O. aspersum,* again, however, in the belief that it was a hybrid, but with the

suggestion that while *O. Rossii* is one parent, the other might be *O. maculatum*, a Mexican species named by La Llave. Subsequent importations of *O. Rossii* have included a certain proportion of individuals that on flowering have suggested some admixture with *O. maculatum*, which is known to grow in the same district as *O. Rossii*. It seems clear now, however, that Mr. Hume's plant was not the first instance of the flowering in this country of a natural hybrid between *O. Rossii* and another species. The plant figured as *O. cordatum* by Paxton, which flowered with Mr. S. Rucker at Wandsworth in 1847, is manifestly the same as the subject of our plate. This plant was afterwards transferred by Veitch to *O. maculatum*, the fact that it is identical with *O. aspersum* being overlooked. The confusion of these two species themselves, for the plant figured as *O. maculatum* at t. 4878 is really *O. cordatum*, may have contributed to the uncertainty as to the parentage of this hybrid. That uncertainty has been increased by the circumstance that the whereabouts of Mr. Hume's plant, if it still survives, is unknown, and by the fact that the material on which Reichenbach based his *O. Humeanum* has lain so long inaccessible in his herbarium. In any event it was essential, before it could be definitely decided whether either, and if so which of the suggestions made by Reichenbach be correct, that advantage be taken of the first suitable opportunity of effecting the necessary artificial cross-fertilisation. By a fortunate accident Mr. Rolfe was able to enlist the interest of Mr. F. H. Moore, of the Royal Infirmary, Liverpool, who in May, 1899, had *O. Rossii* and *O. maculatum* in flower together in his collection. The two species were crossed by Mr. Moore and some hybrid seedlings were raised, one of which has happily survived and has been the subject of careful observation. At six years of age this plant, which had not yet flowered, passed into the care of Mr. W. H. Young, then in charge of the collection at Clare Lawn. A year later, on the death of Sir F. Wigan, it came to Kew, where it has since been grown with other Odontoglossums, planted in a smali basket suspended near the roof-glass of a cool orchid house. In 1918, when nineteen years old, the plant flowered for the first time,

producing the inflorescence of four blooms here figured which agree exactly with those of the wild presumed natural hybrid collected in Mexico.

Description.—*Herb*, epiphytic; pseudobulbs clustered, ovoid-elliptic, somewhat flattened, 1½–2¼ in. long, clothed at the base with ovate-lanceolate sheaths, 2-foliate at the apex. *Leaves* lanceolate-oblong, acute, conduplicate and narrowed at the base, 3–8 in. long, 1–1½ in. wide. *Peduncle* erect or curved, 6–8 in. long, 3-4-flowered. *Flowers* showy, pale yellow with the sepals and the bases of the petals blotched with brown; bracts ovate-lanceolate, acute, ¾–1 in. long; pedicels 1⅓–2 in. long. *Sepals* oblong-lanceolate, acuminate, 1⅓–1½ in. long. *Petals* elliptic, acute, somewhat undulate, 1⅓ in. long, somewhat recurved at the tip. *Lip* wide-clawed, 3-lobed, 1¼ in. long and as much across; lateral lobes small, rather concave; mid-lobe broadly subcordate-orbicular, somewhat undulate; disk with a thick 2-lobed crest. *Column* clavate, ¾ in. long; wings nearly obsolete.

Tab. 8873.—Fig. 1, base of lip; 2, column; 3, anther-cap; 4, pollinia:—*all enlarged.*

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